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FABRICATION AND TEST OF BATTERY SEPARATOR MATERIALS RESISTANT TO THERMAL STERILIZATION

FINAL REPORT

JPL Contract 951015

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RADIATION APPLICATIONS INCORPORATED

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FOREWORD

This report was prepared by Radiation Applications Incorporated, Long Island City, New York, on Jet Propulsion Laboratory Contract 951015, subcontracted under NASA Contract NAS7-100.

ABSTRACT

1. Fifty-one (51) materials were fabricated, using polyethylene as the base polymer, by crosslinking and grafting procedures.

2. Each material was tested for its ability to withstand heat sterilization and to function as a battery separator in the silver-zinc alkaline system.

3. Cells, constructed from seven materials which successfully withstood heat sterilization, retained greater than 90% of electrical capacity of control cells during five deep cycles of charge and discharge.

4. The two materials described below were selected to be produced in 500 ft.^{2} quantities, which are to be used for further testing.

a. JPL/110

This material is an acrylic acid grafted crosslinked low density polyethylene. 0.917 density polyethylene was subjected to ionizing radiation from an electron linear accelerator for a total dose of 70 Mrads prior to being grafted with acrylic acid. The sample has a thickness of 2 mils and an electrical resistance of 43 milliohms-in.^{2} in 40% KOH.

b. JPL/116

This material was fabricated by crosslinking 0.917 density polyethylene with divinyl benzene using gamma radiation. The crosslinked sample was then grafted with acrylic acid. The thickness of the sample was 1.6 mils. The electrical resistance is 30 milliohms-in.^{2} in 40% KOH.

5. Cells were constructed using samples of the above two materials which were sterilized in 40% potassium hydroxide at 145^{o}C for three 36 hour heat cycles. The 40% potassium hydroxide from the sterilization chambers was used as the cell electrolyte. All of the cells retained greater than 96% of the capacity of control cells which were similar except that their components were unsterilized.

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1.0 INTRODUCTION

The purpose of this program was to develop battery separator materials with the ability to withstand sterilization temperatures of 137°C and 145°C while immersed in 40% potassium hydroxide. The program was sponsored by the Jet Propulsion Laboratory, California Institute of Technology, under JPL Contract 951015.

Basically, the work consisted of preparing polyethylene-acrylic acid graft copolymer battery separators using three density grades of polyethylene film which were crosslinked and grafted.

Crosslinking was accomplished with electron beam irradiation or with divinyl benzene and cobalt-60 irradiation. The radiation induced copolymerization of acrylic acid to the base films was accomplished by cobalt-60 irradiation.

Thus the key variables other than density grade were type and degree of crosslinking.

1.1 Preparations

The preparative variations were:

(a) Radiation crosslinking before grafting.

Four levels of irradiation were used on each of the three base polymers. This series produced twelve (12) samples.

(b) Radiation crosslinking of the grafted copolymer. One level of irradiation on samples of each density grade equilibrated at three different levels of relative humidity produced nine (9) samples.

(c) Crosslinking prior to grafting with acrylic acid via grafting of divinyl benzene (DVB). Three levels of DVB on each density grade produced nine (9) samples.

(d) Crosslinking via grafting of divinyl benzene after grafting with acrylic acid. Nine levels of DVB on one density grade of polyethylene produced nine (9) samples.

(e) Crosslinking via simultaneous grafting of divinyl benzene and acrylic acid (AA). Nine ratios of AA-DVB on one density grade produced nine (9) samples.

(f) Fractionated polyethylene based samples. One sample of each density grade was prepared via the best crosslinking technique using specially prepared films. These films were pressed from resins that had been fractionated to remove the low molecular weight fractions. This series produced three (3) samples.

1.2 Testing

After preparation, the samples were characterized by a series of screening tests. These were the determination of:

(a) Thickness

(b) Electrical resistance in 40% KOH

(c) Exchange Capacity

(d) Dimensional changes upon wetting with 40% KOH.

(e) Tensile strength

Samples were then subjected to thermal sterilization and tested as above to determine the degree of thermal degradation.

Two sterilization procedures at two temperatures were employed:

(a) Weighed samples, immersed in 40% KOH, were held at 145°C for thirty-six (36) hours. Samples were removed for testing after one, two and three thirty-six hour heat cycles.

(b) Samples were heated in 40% KOH at 137°C for three twenty-four (24) hour periods, and samples were again removed after each cycle.

The above sterilizations were again performed with the samples wrapped around an unformed silver electrode. The samples, removed from the sterilization chambers as noted above,

were subjected to the separator screening tests. The weight change due to sterilization was also measured.

Two layers of each sample were each wrapped around an unformed electrode. Three such wrapped electrodes were prepared from each sample, and all three were immersed in 40% KOH in a stainless steel sterilization chamber. The chambers were subjected to the 145°C sterilization regimen. Each silver electrode in its separator wrap was then assembled into three plate cells using two unsterilized zinc electrodes and electrolyte solution from the sterilization chamber. Three control cells for each separator were built using all unsterilized components. The capacities of the sterilized-component cells were compared to the capacities of the control cells for five charge-discharge cycles. A constant current charge and discharge was used. The cells of each separator type were charged and discharged in series to ensure constant charge and discharge currents.

Those sterilized component cells that demonstrated capacities of at least 90% of the control cells' capacities were considered to indicate a sterilizable separator.

2.0 DISCUSSION

It has been found that cellophane and fibrous casing battery separators become degraded beyond use when immersed in 40% potassium hydroxide and exposed to a sterilization temperature of 145°C, while polyethylene based graft copolymer membranes remain dimensionally stable and retain their electrical properties[1].

However, during the sterilization of separators consisting of an acrylic acid or methacrylic acid graft on radiation crosslinked high density polyethylene, an unidentified material was extracted. When the sterilization liquor was used to construct secondary silver-zinc cells, this material apparently plates out on the positive electrode and increased the charge voltage so that the cell was unable to accept a full charge. It was uncertain whether this material was an insoluble low molecular weight species of polyethylene acrylic acid copolymer, a soluble polyacrylic acid chain fragment, or a low molecular weight polyethylene fragment.

The objective of this program then, was to develop a polyethylene based battery separator resistant to thermal sterilization in 40% KOH at 145°C.

The general approach to the problem consisted of utilizing various methods of crosslinking in order to stabilize the membrane. The methods of crosslinking selected take into

account all of the above-mentioned mechanisms of extracting material from the separator.

Each of the sample materials was tested for physical and electrical properties both before and after sterilization.

Each sample possessing a suitable electrical resistance was sterilized in 40% KOH at 145°C. Test cells were constructed using the sterilized membrane, sterilized silver electrodes, the sterilization liquor (40% KOH), and unsterilized zinc electrodes. Unsterilized components were used to construct control cells.

The specifications of this contract designated that a membrane meet certain in-cell performance criteria before it could be considered a sterilizable membrane. The decisive criterion was that three plate silver oxide-zinc cells constructed as described above with membranes subjected to the heat-time cycle of three 36 hour "soaks" at 145°C demonstrate 90% of the capacity (A.H.) of cells constructed from the unsterilized components. This capacity ratio had to be maintained for five charge-discharge cycles. Section 4.0 details all of the preparative and testing procedures employed during this program.

2.1 General Approach to Sterilizable Separator Development

The nature of the material being leached from an acrylic acid grafted polyethylene based membrane can be of two types:

(a) an insoluble low molecular weight species of grafted or ungrafted polyethylene, or

(b) a soluble polyacrylic acid chain fragment.

2.1.1 Insoluble Species

The following membrane variations were formulated assuming that the extracted material was of the first type.

2.1.1.1 Crystallinity of the Polyethylene Base Polymer

It is known that amorphous polyethylenes crosslink more readily upon irradiation than the more crystalline polyethylenes[2]. In fact, it was found by Salovey that when single crystals of polyethylene were irradiated the gel fraction (degree of crosslinking) obtained was up to fifty percent less than when the bulk polymer was irradiated under the same conditions[3]. This may be explained as being due to a trapping of induced free radicals in the crystalline areas whereas in the amorphous areas the radical sites are mobile and can move along the chain. When a radical encounters an ethylenic group on a neighboring chain crosslinking results[4]. Polyethylenes of crystallinities from 50% to 80% are available, and, in general, the melting point increases with crystallinity[5].

While the lower density (crystallinity) polyethylenes crosslink more readily, they possess lower initial melting points. In order to optimize the crystallinity of the base polymer three density grades of polyethylene were evaluated.

Density grades of 0.917, 0.938 and 0.960 were selected, and each grade was treated prior to grafting as described in the following sections.

2.1.1.2 Radiation Crosslinking

The relationship of the level of radiation crosslinking to the thermal stability of the membrane was studied by subjecting each of these density grades of polyethylene to various degrees of radiation crosslinking. A previous attempt[6] at formulating a heat sterilizable separator consisted of preparing a high density polyethylene based membrane radiation precrosslinked at 30 Mrads. Since radiation crosslinked membranes do exhibit higher dimensional and thermal stability than uncrosslinked membranes, it was indicated that higher degrees of crosslinking may result in increased heat resistance. However, since degradation does also occur during crosslinking, a lower dose was also examined. Each of the base polymers was subjected to radiation precrosslinking doses of 10, 30, 50 and 70 Mrads.

When polyethylene is irradiated in the presence of air, oxygen diffuses into the polymer and reacts with the free radical sites forming -OH, -COOH, C-O-O-C, and C-O groups. Reaction with oxygen causes degradation of the film especially at high radiation doses. In addition, peroxide type crosslinks can be thermally decomposed during sterilization. To prevent this,

these base polymer films were crosslinked in an inert nitrogen atmosphere.

2.1.1.3 Precrosslinking via Multifunctional Monomers

When high energy radiation is used to crosslink polyethylene, a certain amount of degradation also takes place. In order to crosslink the base polymer with a minimum of radiation induced degradation, each of the base polymer materials were precrosslinked by grafting the polyethylene with divinyl benzene (DVB). Although this crosslinking was also radiation catalyzed, the total dose required was substantially less than that necessary for straight radiation crosslinking. The required dose was less than 1 Mrad. Since DVB crosslinking took place in a DVB-methanol solution, the polyethylene base polymer was not exposed to an oxidizing atmosphere during irradiation.

2.1.1.4 Molecular Weight Distribution of the Polyethylene

Samples of each of the three density grades of polyethylene resin were processed to remove the low molecular weight fractions and then cast into a film. The objective was to remove the source of short polyethylene chain fragments which might be leached from the membrane during the sterilization process. The film was then subjected to the most promising crosslinking and grafting procedure as determined by the other phases of the program.

2.1.2 Soluble Species

The following membrane variations were formulated assuming that the extracted material was a soluble polyacrylic acid chain fragment.

2.1.2.1 Simultaneous Divinyl Benzene-Acrylic Acid Graft

The optimum density base polymer, as determined by in-cell performance of radiation precrosslinked membranes and divinyl benzene precrosslinked membranes, was simultaneously grafted with divinyl benzene and acrylic acid. The purpose of this procedure was to form a crosslinked polyacrylic acid polyethylene copolymer. In addition to crosslinking the polyacrylic acid, the divinyl benzene served to crosslink the polyethylene matrix to itself and to produce additional bonds from the polyethylene backbone to the acrylic acid side chains.

Various degrees of crosslinking were achieved by using several divinyl benzene-acrylic acid ratios. This method of crosslinking and grafting had the advantage of being a single step process.

2.1.2.2 Postcrosslinking via Multifunctional Monomers

Higher degrees of crosslinking than that obtainable by simultaneous divinyl benzene-acrylic acid grafting were obtained by a divinyl benzene post graft on a polyethylene-acrylic acid copolymer. The acrylic acid grafted optimum

density base polymer was subjected to several levels of postcrosslinking grafts.

2.1.2.3 Radiation Induced Postcrosslinking in the Presence of Various Relative Humidities

The degree of radiation induced crosslinking of polyacrylic acid is a function of the moisture content of the membrane while the membrane is being irradiated. Theoretically, a water swollen membrane would give the highest degree of crosslinking. However, the water also serves as a radiation barrier which may reduce the effectiveness of the radiation. Therefore, membranes equilibrated with a range of relative humidities were utilized in order to establish the optimum conditions.

2.2 Test Results

A general outline of the variations employed in the fabrication of the separators is given in Table 1, while more complete details for the individual groups of separators are presented in Tables 2 through 7.

2.2.1 Radiation Precrosslinked Samples (Nos. 101-112)

Each of the three density grades of polyethylene (0.917, 0.938, 0.960) were subjected to four levels of irradiation (10, 30, 50 and 70 Mrads) thus producing twelve samples.

Two samples from this group met the in-cell performance requirements for a sterilizable separator. Both of these

samples are based on 0.917 density polyethylene and are described below. The conditions of fabrication for this group of samples will be found in Table 2 and section 4.1.1.

2.2.1.1 Sample No. 107

This sample is based on 0.917 density polyethylene precrosslinked at a radiation dose of 50 Mrads. Test cells incorporating two layers of sterilized membranes and the sterilization liquor retained an average of 98.5% of the electrical capacity of similar control cells having unsterilized components. The test consisted of five charge/discharge cycles. These data are presented in Table 33. The properties of this membrane as determined by the separator screening tests are given below in tabular form:

Thickness: 0.0019 in.

Electrical Resistance: 52 milliohms-in.^{2} in 40% KOH

Swelling: (Increase in area due to wetting with 40% KOH)

14.2

Exchange Capacity: 5.46 meq/gm

Tensile Strength: 1013 psi

(The above values are an average of two measurements).

2.2.1.2 Sample No. 110

This sample is based on 0.917 density polyethylene precrosslinked at a radiation dose of 70 Mrads. The sterilized cells retained an electrical capacity of 96.5% to 99.0% of control cell capacity over five cycles (see Table 33). A description of the screening test results is as follows:

Thickness: 0.0021 in.

Electrical Resistance: 43 milliohms-in.^{2} in 40% KOH

Swelling: (Increase in area due to wetting with 40% KOH)

10.9

Exchange Capacity: 4.25 meq/gm

Tensile Strength: 1002 psi

(The above values are an average of two measurements).

2.2.2 Samples Precrosslinked with Divinyl Benzene (DVB) (Nos. 113-121)

Each of the three density grades of polyethylene were subjected to three levels of DVB crosslinking thus producing nine samples.

Two samples from this group met the in-cell performance requirements for a sterilizable separator. Both samples are based on 0.917 density polyethylene. Table 3 outlines

the solution concentrations and conditions of irradiation for this group. The sterilizable samples are described in the following two sections.

2.2.2.1 Sample No. 116

The preparative information for this sample is given in Table 3 and section 4.1.2. The sterilized cells retained an electrical capacity of 97.4% to greater than 100% of control cell capacity (see Table 34). The membrane is characterized as follows:

Thickness: 0.0016 in.

Electrical Resistance: 30 milliohms-in.^{2} in 40% KOH

Swelling: (Increase in area due to wetting with 40% KOH)

10.7

Exchange Capacity: 6.67 meq/gm

Tensile Strength: 852 psi

(The above values are an average of two measurements).

2.2.2.2 Sample No. 119

The preparative information for this sample is given in Table 3 and section 4.1.2. The electrical capacity of sterilized cells relative to controls ranged from 96.0% to 99.6% during the five cycles (see Table 34). The membrane is characterized as follows:

Thickness: 0.0015 in.

Electrical Resistance: 35 milliohms-in.^{2} in 40% KOH

Swelling: (Increase in area due to wetting with 40% KOH)

11.6

Exchange Capacity: 5.24 meq/gm

Tensile Strength: 578 psi

(The above values are an average of two measurements).

2.2.3 Samples Radiation Postcrosslinked at Various Relative Humidities (Nos. 122-129)

Each of the three density grades of polyethylene were first grafted with acrylic acid and then subjected to gamma radiation at each of three relative humidity levels, thus producing nine samples. None of the samples from this group met the in-cell performance requirements for a sterilizable separator. The preparative data is described in Table 4 and section 4.1.3. Table 35 gives the cell test results. All sterilized cells either shorted or showed extremely low capacity before the fifth cycle.

2.2.4 Samples Postcrosslinked with Divinyl Benzene (DVB) (Nos. 131-139)

One density grade of polyethylene (0.917) was grafted with three levels of acrylic acid graft and cross-

linked with three levels of DVB thus producing nine samples. The two samples described in the following two sections met the requirements for a sterilizable separator.

2.2.4.1 Sample No. 136

The preparative procedures for this sample are outlined in Table 5 and section 4.1.4. The electrical capacity of sterilized cells relative to controls, for this membrane, ranged from 95.6% to greater than 100% during the five cycles (see Table 36). The sample has the following properties:

Thickness: 0.0021 in.

Electrical Resistance: 36 milliohms-in.^{2} in 40% KOH

Swelling: (Increase in area due to wetting with 40% KOH)

11.1

Exchange Capacity: 4.36 meq/gm

Tensile Strength: 1187 psi

(The above values are an average of two measurements).

2.2.4.2 Sample No. 139

The preparative procedures for this sample are outlined in Table 5 and section 4.1.4. The electrical capacity of sterilized cells relative to controls ranged from 91.0% to 93.4% during the five cycles (see Table 36). The sample has the following properties:

Thickness: 0.0019 in.

Electrical Resistance: 28 milliohms-in.^{2} in 40% KOH

Swelling: (Increase in area due to wetting with 40% KOH)

13.0

Exchange Capacity: 4.63 meq/gm

Tensile Strength: 669 psi

(The above values are an average of two measurements).

2.2.5 Samples Simultaneously Grafted with Acrylic Acid and Divinyl Benzene (DVB) (Nos. 140-148)

One density grade of polyethylene (0.917) was simultaneously grafted with one level of acrylic acid graft and nine levels of DVB thus producing nine samples. One sample from this group met the requirements for a sterilizable separator and is described in the following section.

2.2.5.1 Sample No. 143

The preparative procedures for this sample are described in Table 6 and section 4.1.5. The electrical capacity of sterilized cells relative to controls ranged from 95.2% to greater than 100% (see Table 37). The sample has the following properties:

Thickness: 0.0017 in.

Electrical Resistance: 38 milliohms-in.^{2} in 40% KOH

Swelling: (Increase in area due to wetting with 40% KOH)

10.8

Exchange Capacity: 4.58 meq/gm

Tensile Strength: 861 psi

(The above values are an average of two measurements).

2.2.6 Samples Prepared from Fractionated Polyethylene (Nos. 149-151)

Samples of each of the three density grades of polyethylene with the low molecular weight fraction removed were radiation crosslinked prior to grafting with acrylic acid. This series produced three samples.

3.0 SUMMARY AND CONCLUSIONS

All of the test data gathered in the testing of the fifty-one samples are presented in Tables 1 through 37. There are several major points to be noted. These are:

(a) There is no detectable difference of separator degradations between separators sterilized at 145°C and at 137°C.

(b) Samples sterilized in the absence of an unformed silver electrode are not noticeably different in properties from those sterilized in the presence of a silver electrode.

(c) At both sterilization temperatures there is relatively little change in the physical or electrical properties after the first sterilization cycle, and there are no time-temperature trends readily discernible.

(d) The important tests are those of resistance, dimensional change, initial exchange capacity and, of course, the in-cell testing, all of the other tests appear to have little value in defining a separator membrane.

(e) The seven samples meeting the sterilizability requirements specified by the Jet Propulsion Laboratory are all based on the low density (0.917)

grade of polyethylene.

(f) Additionally, all of the seven sterilizable samples have as a common denominator a high degree of crosslinking and a high level of acrylic acid graft.

(g) It would appear that exclusive of the post-grafting irradiation crosslinked samples (Nos. 122-130), the crosslinking technique has little effect on the separator provided that a sufficient degree of crosslinking is obtained.

(h) The two higher density grades (.938 and .960) of polyethylene, neither of which produced a sterilizable separator, contain significant fractions of very low molecular weight material.

4.0 PREPARATIVE AND TESTING PROCEDURES

4.1 Preparative Procedures

The general preparative procedures for the samples developed on this program are described in the following paragraphs. Table 1 summarizes the sample numbers and designations.

4.1.1. Radiation Precrosslinked Samples (Nos. 101-112)

The general preparative procedure for this group of samples is as follows:

(1) A 200-foot strip of polyethylene film, 13 inches wide, was rolled up on a 6-inch cardboard core.

(2) The roll was then wrapped in a piece of 6-mil polyethylene film, which was heat sealed except for a small opening on either end of the core.

(3) The bag was purged with nitrogen for approximately four hours and then sealed. This bag was then sealed into a second bag which was similarly purged with nitrogen.

(4) The roll was then brought to Radiation Dynamics, Inc., Westbury, Long Island for cross-linking, within 24 hours after sealing.

(5) Crosslinking was accomplished by rotating the roll under the beam of a 1.5 mev electron accelerator for 1 minute and then cooling in air for three minutes. The dose received during this sequence was 2.5 Mrads. This procedure was repeated until the desired total radiation crosslinking dose was obtained.

(6) Within four hours after crosslinking, the roll was returned to RAI and placed in an oven for twelve hours at 70°C to anneal out the free radicals.

(7) The inner and outer 50-feet of the roll were discarded in order to obtain only the most uniformly irradiated material.

(8) Next, a 30-foot strip from the remaining 100-foot section was rolled into a helix with a strip of absorbent paper toweling.

(9) A glass test tube measuring 6.7 cm. in diameter and 46 cm. high was filled with 1,000 cc. of the acrylic acid grafting solution.

(10) The roll was then immersed in the solution and allowed to stand for 24 hours.

(11) Next, the test tube was placed on a rotating platform in a Cobalt-60 source for the appropriate period of time.

(12) The test tube was then removed from the source, the sample unrolled, and the paper discarded.

(13) The sample membrane was placed first in a 5% KOH bath at 80°C for 24 hours, then placed into a water bath at 80°C for 24 hours, then rolled up in paper toweling and dried.

(14) When reiterative grafting was required, the roll was again subjected to steps 9 through 13.

Detailed information on the preparative procedures is tabulated in Table 2.

4.1.2 Samples Precrosslinked with Divinyl Benzene (DVB) (Nos. 113-121)

This group of samples consisted of three levels of DVB graft on each of the three density grades of polyethylene base polymer. The general preparative procedure was as follows:

(1) A 30-foot strip of uncrosslinked polyethylene film was rolled into a helix with a strip of absorbent paper toweling.

(2) A glass test tube 6.7 cm. in diameter and 46 cm. high was filled with 1,000 cc. of a solution of divinyl benzene in methanol.

(3) The roll was immersed in the test tube and allowed to equilibrate for 24 hours.

(4) Next, the test tube was placed on a rotating platform in a Cobalt-60 source for the appropriate period of time.

(5) The test tube was then removed from the source, the sample unrolled, and the paper discarded.

(6) The film was rinsed with benzene and re-rolled in fresh paper toweling.

(7) A test tube was then filled with 1,000 cc. of an acrylic acid-benzene solution and the roll immersed therein.

(8) The test tube was then irradiated again in the cobalt-60 source.

(9) Next, the sample was removed, washed in 5% KOH at 80°C, then washed in water at 80°C, and then dried in paper toweling.

Solution concentrations, doses and dose rates are listed in Table 3.

4.1.3 Samples Postcrossliked at Various Relative Humidity Levels (Nos. 122-130)

These samples consist of acrylic acid grafts on three density grades of polyethylene film, radiation postcrosslinked at three different relative humidities. The general preparative

procedure was as follows:

(1) A 30-foot strip of uncrosslinked polyethylene film was rolled into a helix with a strip of absorbent paper toweling.

(2) A glass test tube, 6.7 cm. in diameter and 46 cm. high was filled with 1,000 cc. of acrylic acid benzene solution.

(3) The roll was immersed in the test tube and allowed to equilibrate for 24 hours.

(4) Next, the test tube was placed on a rotating platform in a cobalt-60 source for the appropriate period of time.

(5) The test tube was then removed from the source, the sample unrolled and the paper discarded.

(6) The sample was placed in a 5% KOH bath of 80°C for 24 hours, then placed in a water bath at 80°C for 24 hours, then rolled up in paper toweling and dried.

(7) Next, the bottom of a large test tube was covered with 100 cc. of sulfuric acid of such a concentration as to provide the desired relative humidity.

(8) The sample, which had been loosely rolled in fresh paper toweling, was placed in the test tube on a small plastic stand which kept it above the liquid level.

(9) The test tube was purged with nitrogen for four hours and then sealed with Glyptal.

(10) The test tube was then placed in the cobalt-60 source and irradiated for a given period of time.

(11) The sample was then removed, rerolled in fresh paper toweling, and dried.

The preparative data for each sample is listed in Table 4.

4.1.4 Samples Postcrosslinked with Divinyl Benzene (DVB) (Nos. 131-139)

These samples consist of three levels of acrylic acid graft and three levels of DVB postcrosslinking graft on a single grade of polyethylene film. The general preparative procedure was as follows:

(1) A 30-foot strip of uncrosslinked polyethylene film was rolled into a helix with a strip of absorbent paper toweling.

(2) A glass test tube 6.7 cm. in diameter and 46 cm. high was filled with 1,000 cc. of an acrylic acid-benzene solution.

(3) The roll was immersed in the test tube and allowed to equilibrate for 24 hours.

(4) Next, the test tube was placed on a rotating platform in a cobalt-60 source for the appropriate period of time.

(5) The test tube was then removed from the source, the sample unrolled and the paper discarded.

(6) The sample was washed in 5% KOH at 80° C for 24 hours, then washed in water at 80° C for 24 hours, then rolled up in paper toweling and dried.

(7) Next, a test tube was filled with 1,000 cc. of a DVB-methanol solution.

(8) The dried sample was rerolled in fresh paper toweling, immersed in the solution, and allowed to equilibrate for 24 hours.

(9) Then, the test tube was placed on a rotating platform in the cobalt-60 source for the appropriate period of time.

(10) The test tube was removed from the source, the sample unrolled, and the paper discarded.

(11) Next, the sample was washed, first with benzene, then with 5.0% KOH at 80° C and finally with water at 80° C. The sample was then dried in paper toweling.

The solution concentrations and conditions of irradiation are outlined in Table 5.

4.1.5 Samples Simultaneously Grafted with Acrylic Acid and Divinyl Benzene(DVB (Nos. 140-148)

The samples consist of nine variations of simultaneous acrylic acid-DVB grafts on one grade of polyethylene film. The general preparative procedure is as follows:

(1) A 30-foot strip of uncrosslinked polyethylene film was rolled into a helix with a strip of absorbent paper toweling.

(2) A glass test tube, 7.7 cm. in diameter and 46 cm. high was filled with a grafting and crosslinking solution consisting of acrylic acid, DVB, carbon tetrachloride, and benzene.

(3) The roll was immersed in the test tube and allowed to equilibrate for 24 hours.

(4) Next, the test tube was placed on a rotating platform in a cobalt-60 source for the appropriate period of time.

(5) The test tube was then removed from the source, the sample unrolled and the paper discarded.

(6) The sample was washed in 5% KOH at 80° C for 24 hours, then washed in water at 80° C for 24 hours, then dried in paper toweling.

Table 7 outlines the solution concentrations and conditions of irradiation.

4.1.6 Samples Prepared from Fractionated Polyethylene (Nos. 149-151)

These samples consist of an acrylic acid graft on a sample of each grade of polyethylene, radiation precrosslinked at 50 Mrads. Before casting of the films, the low molecular weight fraction of each grade of polyethylene had been extracted. The general preparative procedure is as follows:

The low molecular weight fractions of each density grade of polyethylene were removed according to the fractionation method of L. H. Tung[6]. In this procedure the resin is dissolved in xylene at 130° C, and sufficient triethylene glycol is added to precipitate out the desired portion of the polymer as a gel phase. The fractionation was run at 130° C (above the crystalline melting point of polyethylene). After the gel phase and the lean phase of each density polyethylene were

separated, each was poured into methanol and then the precipitated polymer filtered off, washed well with additional methanol and dried in a vacuum oven to constant weight.

The films were prepared by placing fractionated, ground polymer resin between stainless steel parallel plates spaced 2 mils apart by a stainless steel shim. The parallel plates were placed in a heated hydraulic press and subjected to a temperature of 150° F and a pressure of 28 tons for a period of ten minutes. The samples measured five inches square.

Each sample was placed in a polyethylene pouch, then purged with nitrogen and sealed. The samples were precrosslinked using a 1.5 mev electron accelerator at 2.5 Mrads per pass for a total dose of 50 Mrads.

The samples were then laid out on a piece of paper toweling and rolled into a helix. The remainder of the process was the same as that used to prepare radiation precrosslinked membranes and is described in Section 4.1.1, steps 9 through 14. Table 7 lists the preparative data.

4.2 Separator Screening Tests

After each sample membrane was prepared, an initial electrical resistance check was made to determine whether the electrical resistance in 40% KOH was less than 60 milliohms-in.^{2} per mil of membrane thickness as specified by JPL. If

the sample failed to meet this requirement, then the grafting solution and irradiation dose were varied in an attempt to bring down the resistance of the sample (the procedure is discussed, for each group of samples, in section 4.1.1 through 4.1.6). The following measurements were made, in duplicate, on all samples meeting the above resistance requirement.

4.2.1 Weight and Dry Thickness Measurement

A rectangular section of the sample, measuring approximately 1-1/2 inches by 6 inches, was dried to constant weight in a desiccator at 60° C. The dry dimensions of the sample were then recorded and the thickness was measured using a constant pressure micrometer.

4.2.2 Electrical Resistance Measurement

The electrical resistance was determined using the circuit and resistance cell depicted in Figures I, II and III. A 1,000 cycle AC signal generated by an Electro Measurements Inc. impedance bridge, model no. 250-c1, was passed through the cell which was immersed in 40% KOH. The cell is constructed entirely of plexiglas except for the two 1-inch square platinized platinum electrodes. When the cell is in the closed position, the electrodes are spaced 0.050 inch apart. The signal is amplified with a 60 watt Dynakit amplifier and the null point is read on a Hickok, model 455 VOM. The

procedure for obtaining resistance readings is as follows:

(1) The resistance of the cell in 40% KOH was determined. This reading is called the cell constant, R_c.

(2) Next, the 1-1/2 x 6 inch membrane was inserted into the channel with one end of the sample level with the bottom of the cell.

(3) Cell readings were then taken at intervals of one minute until a constant minimum reading was obtained. This reading, $R_c + _M$, constituted the resistance of the cell and the membrane.

(4) The membrane resistance was then determined from $R_M = R_{c+M} - R_c$.

(5) The time required for a constant minimum resistance reading to be obtained was known as the wet-out time (t_{wo}) for the sample.

4.2.3 Swelling (Change of Dimensions Upon Wetting with 40% KOH)

When an acrylic acid grafted polyethylene based membrane is immersed in a KOH solution, the sample area increases and changes in the membrane thickness may also occur. The following measurements were therefore made on each sample in order to provide design data for eventual use of the membrane in wrapping electrodes.

(1) The 1-1/2 inch by 6 inch sample strip used for the previously described tests was immersed in 40% KOH for no less than the minimum wet-out time (t_{wo}), described in paragraph 4.2.2.

(2) The sample was removed from the caustic, and blotted lightly with absorbent paper to remove any droplets of KOH from the surface.

(3) Next, the length and width of the sample were measured using a rule calibrated in sixteenths of an inch. The thickness was then determined with the constant pressure micrometer.

(4) The following calculations were then made:

(a) % Increase in Width, $W = \frac{\text{Wet Width-Dry Width}}{\text{Dry Width}} \times 100$

(b) % Increase in Length, $L = \frac{\text{Wet Length-Dry Length}}{\text{Dry Length}} \times 100$

4.2.4 Exchange Capacity Measurement

The exchange capacity of each sample was measured as a further means of characterizing the membrane. The following procedure was used to determine the exchange capacity:

(1) The sample was immersed in approximately 250 ml of ca. 0.1N HCl and allowed to equilibrate for 24 hours at room temperature.

(2) Next, the sample was removed from the HCl and dried to constant weight at 60° C.

(3) The membrane was immersed in exactly 50.0 ml. of standardized KOH and allowed to equilibrate for 24 hours at room temperature.

(4) Standardized HCl was titrated against a 10 ml. aliquot of the KOH solution in order to determine the change of normality of the KOH.

(5) The exchange capacity was then calculated from:

$$\text{Ex. Cap.} = \frac{\Delta N_{(KOH)}(50)}{\text{Wt. sample (dry acid form)}}$$

4.2.5 Tensile Strength

The tensile strength of each sample, wet with 40% KOH, was measured with a Model M. Dillon Tester. Two determinations were made with each of the aforementioned 1-1/2 inch by 6 inch samples.

4.3 Thermal Degradation Study

Thermal degradation studies were performed on each sample that successfully passed the screening test specifications. The purpose of the thermal degradation test was to determine the stability of the sample membranes under actual sterilization conditions. The following four paragraphs describe the testing procedures.

4.3.1 Thermal Degradation in 40% KOH at 145° C

Six samples of each membrane were sealed in stainless steel containers with enough 40% potassium hydroxide to completely immerse the samples. The samples measured approximately 1-1/2 inches by 6 inches with the exact dry weight and dimensions being recorded before sterilization. The containers were then placed in an oven, heated to 145° $\pm$2° C, maintained at 145° C for a period of 36 hours, and then cooled to room temperature. At this point two of the containers were removed from the oven. The sequence was then repeated twice more for a total of three 36 hour sterilizations. Two containers were removed from the oven at the end of each heat cycle. The time/temperature sequence was as follows:

Time (Hrs.)	Oven Switch	Occurrence
0	goes on	Start of temperature rise to 145° C.
2	-	Start of sterilization No. 1
38	goes off	Oven cools to room temperature. First two samples are removed.
41	goes on	Start of temperature rise to 145° C.
43	-	Start of sterilization No. 2
79	goes off	Oven cools to room temperature. Second two samples are removed.
86	goes on	Start of temperature rise to 145° C.
88	-	Start of sterilization No. 3
124	goes off	Completion of sterilization cycles. Final two samples are removed.

Each of the sterilized samples was subjected to the screening tests described in Section 4.2 in order to determine whether any physical or chemical changes took place as a result of thermal sterilization.

4.3.2 Thermal Degradation in 40% KOH at 145° C in the Presence of a Silver Electrode

This test is similar to that described in Section 4.3.1 except that each sample membrane was wrapped around an unformed silver electrode during the sterilization process.

4.3.3 Thermal Degradation in 40% KOH at 137° C

Six samples of each membrane were sealed in stainless steel chambers containing enough 40% potassium hydroxide to completely immerse the samples. The samples measured approximately 1-1/2 inches by 6 inches with the exact weight and dimensions being recorded before sterilization. The chambers were then placed in an oven, heated to 137° $\pm$2° C, maintained at that temperature for a period of 24 hours and then cooled to room temperature. At this point, two of the chambers were removed from the oven. The sequence was then repeated twice more for a total of three 24 hour sterilizations. Two chambers were removed from the oven at the end of each heat cycle. The time/temperature sequence is as follows:

Time (Hrs.)	Oven Switch	Occurrence
0	goes on	Start of temperature rise to 137° C.
1	-	Start of sterilization No. 1.
25	goes off	Oven cools to room temperature. First two samples are removed.
48	goes on	Start of temperature rise to 137° C.
49	-	Start of sterilization No. 2.
73	goes off	Oven cools to room temperature. Second two samples are removed.
96	goes on	Start of temperature rise to 137° C.
97	-	Start of sterilization No. 3.
121	goes off	Completion of sterilization cycles. Final two samples are removed.

Each of the sterilized samples was then subjected to the screening tests described in section 4.2.

4.3.4 Thermal Degradation in 40% KOH at 137° C in the Presence of a Silver Electrode

This test is similar to that described in section 4.3.3 except that each sample membrane was wrapped around an unformed silver electrode during the sterilization process.

4.4 In-Cell Performance

In order to determine the effect that sterilization of the membranes has on cell capacity, each sample that met the

screening test specifications was tested in three plate silver-zinc tests cells for a total of five cycles. The testing procedure was as follows:

Twelve pieces, each measuring 4-3/4 inches square, were cut from each sample roll. Two pieces were wrapped around each of three unformed silver electrodes and placed in a stainless steel sterilization container with enough 40% potassium hydroxide to build three cells. The container was then subjected to three 36-hour sterilizations at 145° C using the time/temperature sequence described in section 4.3.1. Three test cells were built with each cell containing a sterilized silver electrode, the sterilized sample membrane, and the sterilization liquor. Two unsterilized unformed zinc electrodes were used as the negative plates.

The cells were constructed as follows:

Two pieces of sample membrane were placed together and folded across the middle parallel to one side forming a "U" shape. A silver electrode measuring 2 inches high by 1-1/2 inches wide was placed in the center of the folded separators. Two zince oxide plates were then placed against the separator, one on each side of the silver electrode against the outside of the "U" shape. The excess separator material was then folded around the back of the zinc plates, thus completing the electrode wrap.

The wrapped electrodes were placed in a Plexiglas cell case with inside cross-sectional dimensions 1-5/8 inches by 3/8 inch. The inside case height was 2-1/2 inches. The cell was then shimmed with several 1/16 inch Plexiglas shims before adding the electrolyte solution. A quantity of electrolyte solution was added to the cell such that the level corresponded to the top of the plates. The opening at the top of the cell was covered with a layer of 6-mil polyethylene.

Three control cells were constructed in exactly the same manner using unsterilized components.

The group of six cells was charged in series at a constant current of 100 ma to a cell cutoff voltage of 2.1 VDC. Then the cells were discharged in series at a constant current of 0.5A to a cell cutoff voltage of 1.0 VDC. Each test consisted of five charge/discharge cycles.

5.0 FINAL SAMPLE NO. 116

5.1 Preparative Procedure

The preparative procedure for the final sample of Sample No. 116 differs from the laboratory procedure in that the final sample was fabricated in a large stainless steel reactor whereas the laboratory sample was formulated in 30 foot lengths in test tubes. The preparative procedure is as follows:

1. A 600 foot length of 0.917 density polyethylene film was rolled into a helix with a similar length of cheesecloth on a three inch cardboard core. The cheesecloth measured 18 inches wide and the polyethylene film which was 13 inches wide, was centered on it. The diameter of the completed helix was 9 7/8 inches.
2. A stainless steel batch reactor measuring 30 inches high and 11 inches inside diameter was filled with a crosslinking solution of the following composition: 1.0% divinyl benzene, 1.0% benzene, and 98% methanol by volume. The total volume was 36 liters.
3. The roll was immersed in the solution and allowed to equilibrate for a period of 24 hours.

4. Next, a stainless steel cover was bolted onto the reactor. Centered on the cover and perpendicular to it was a 2.5 inch diameter wooden dowel 28 inches long. When the cover was put in place, the dowel was slid through the center of the cardboard core to insure that the roll remained centered in the reactor.

5. The stainless steel reactor was placed on a rotating platform in a cobalt-60 source for 22 hours. The dose rate was 25×10^3 rads/hour.

6. Next, the reactor was opened, and the roll removed.

7. The film was then unrolled from the roll into fresh cheesecloth. During the rerolling process, the film was passed through a benzene bath with the residence time in the benzene being approximately 30 seconds.

8. Next, a stainless steel reactor, as described in step 2, was filled with 36 liters of a solution of the following composition:

Component	Weight Percent
Acrylic Acid	26.5
Benzene	69.9
Carbontetrachloride	3.6

9. The roll was immersed in the solution and allowed to equilibrate for 24 hours.

10. The reactor was closed as described in step 4.

11. The reactor was then placed in a rotating platform in a cobalt-60 source for 144 hours. The dose rate was 10,500 rads/hour.

12. The film was unrolled from the roll.

13. Next, the film was processed by immersing it first in 5% potassium hydroxide at 80°C for 4 minutes, then in water at 80°C for 2 minutes.

14. The film was then dried in paper toweling at room temperature.

5.2 Testing

The following tests were performed on samples taken each 50 feet on the 500 foot final sample roll:

a. Thickness

b. Electrical resistance in 40% potassium hydroxide.

c. Swelling (change in physical dimensions due to wetting with 40% KOH.)

d. Exchange capacity

e. Tensile strength

f. In-cell performance of sterilized and control cells.

Tests a. through e. are described in section 4.2 under separator screening tests. Test f. is described in section 4.4 under in-cell performance. A total of ten sterilized and ten control cells were tested. Samples were taken every 50 feet of the 500 foot roll. All of the test cells constructed from sterilized components successfully met the in-cell performance requirements of 90% capacity retention relative to control cell having unsterilized components.

The data are tabulated on the following pages.

In-Cell Performance for Final Sample No. 116
Cell Capacity (AH)

Cell No.	Cycle No. 1	2	3	4	5	Capacity Retention of Sterilized Cells Relative to Controls (%) Cycle No. 1	2	3	4	5
1S	1.09	1.12	1.09	1.08	1.09	97.3	100+	95.6	96.4	96.5
1C	1.12	1.11	1.14	1.12	1.13					
2S	1.11	1.13	1.13	1.10	1.10	98.3	100.0	100+	100.0	98.3
2C	1.13	1.13	1.12	1.10	1.12					
3S	1.09	1.12	1.12	1.10	1.11	94.8	98.3	96.6	95.7	97.4
3C	1.15	1.14	1.16	1.15	1.14					
4S	1.11	1.14	1.14	1.13	1.12	94.8	100.0	100+	97.5	97.4
4C	1.17	1.14	1.13	1.16	1.15					
5S	1.13	1.13	1.13	1.13	1.13	100+	100+	99.1	100.0	100+
5C	1.11	1.11	1.14	1.13	1.11					
6S	1.12	1.13	1.15	1.13	1.12	98.3	100+	100+	100.0	100+
6C	1.14	1.12	1.14	1.13	1.12					
7S	1.11	1.14	1.13	1.12	1.11	99.2	100+	98.3	96.5	97.4
7C	1.12	1.13	1.15	1.16	1.14					
8S	1.11	1.14	1.12	1.11	1.10	98.3	99.2	97.4	97.4	96.5
8C	1.13	1.15	1.15	1.14	1.14					
9S	1.10	1.10	1.09	1.10	1.10	97.3	97.3	95.6	95.6	96.5
9C	1.13	1.13	1.14	1.15	1.14					
10S	1.11	1.12	1.11	1.10	1.11	99.2	97.4	97.4	95.6	96.6
10C	1.12	1.15	1.14	1.15	1.15					

Note: S = Sterilized Cells
C = Control Cells

Separator Screening Tests for Final Sample No. 116

Sample No.	Thickness (Inches)	Resistance (milliohms-in^2)	Dry Length	Dry Width	Wet Length	Wet Width	Wet Thickness	Exchange Capacity (meq/gm)	Tensile Strength (Psi)
1	0.0014	30	5 3/4	1 7/16	6 1/16	1 1/2	0.0016	5.07	1170
2	0.0012	41	5 7/8	1 3/8	5 15/16	1 7/16	0.0014	2.65	955
3	0.0015	36	5 7/8	1 3/8	6 1/16	1 1/2	0.0016	3.82	1840
4	0.0014	30	5 11/16	1 3/8	6	1 1/2	0.0016	4.43	1840
5	0.0014	32	5 3/4	1 7/16	6 1/8	1 1/2	0.0015	5.05	1070
6	0.0013	26	5 15/16	1 3/8	6 1/8	1 7/16	0.0014	3.01	955
7	0.0014	38	5 13/16	1 7/16	6	1 1/2	0.0016	3.57	835
8	0.0013	42	5 7/8	1 7/16	6 1/16	1 1/2	0.0015	3.29	892
9	0.0013	44	5 13/16	1 3/8	6	1 7/16	0.0013	3.37	1029
10	0.0014	43	5 13/16	1 3/8	5 7/8	1 7/16	0.0014	3.36	764

6.0 FINAL SAMPLE NO. 110

6.1 Preparative Procedure

The final sample of separator No. 110 was fabricated in the large stainless steel reactors described in section 5.1. The preparative procedure is as follows:

1. A 1,000 foot length of 0.917 density polyethylene film, 13 inches wide, was rolled up on a three foot diameter cardboard core.
2. Two 6 mil polyethylene bags were then fitted around the roll with a small opening left at the center of each flat side.
3. The roll was purged with nitrogen for 4 hours and then sealed.
4. Next, the roll was delivered to Radiation Dynamics Inc., Westbury, New York for radiation crosslinking.
5. Crosslinking was accomplished using a 1.5 MEV linear accelerator at a dose rate of 2.5 megarads per pass. The total dose was 70 megarads.
6. The roll was then returned to RAI and placed in an oven at 50°C to anneal out the free radicals.
7. The first 200 feet of the 0.917 density polyethylene were discarded.

8. The next 600 feet of the polyethylene was rolled into a helix with a similar length of cheesecloth on a three inch cardboard core. The cheesecloth measured 18 inches wide and the polyethylene film which was 13 inches wide, was centered on it. The diameter of the completed helix was 9 7/8 inches.

9. A stainless steel batch reactor measuring 30 inches high and 11 inches inside diameter was filled with 36 liters of a grafting solution of the following composition:

Component	Weight Percent
Acrylic Acid	26.5
Benzene	69.9
Carbontetrachloride	3.6

10. The roll was immersed in the solution and allowed to equilibrate for a period of 24 hours.

11. Next, a stainless steel cover was bolted onto the reactor. Centered on the cover and perpendicular to it was a 2.5 inch diameter wooden dowel 28 inches long. When the cover was put in place, the dowel was slid through the center of the cardboard core to insure that the roll remained centered in the reactor.

12. The stainless steel reactor was placed on a rotating platform in a cobalt-60 source for 168 hours. The dose rate was 10,500 rads/hour.

13. Then the reactor was opened and the film unrolled from the helix.

14. Next, the film was processed by immersing it first in 5% potassium hydroxide at 80°C for 4 minutes, then in water at 80°C for 2 minutes.

15. The film was then dried in paper toweling at room temperature.

6.2 Testing

The testing procedures for final Sample No. 110 are the same as those described in section 5.2. Each of the samples exhibited very good uniformity in the separator screening and cell testing. All of the test cells successfully met the in-cell performance requirements of 90% capacity retention relative to control cells having unsterilized components.

The data are tabulated on the following pages.

In-Cell Performance for Final Sample No. 110
Cell Capacity (AH)

Cell No.	Cycle No. 1	2	3	4	5	Capacity Retention of Sterilized Cells Relative to Controls (%) Cycle No. 1	2	3	4	5
1S	1.15	1.17	1.15	1.17	1.17	98.6	100.0	99.2	99.2	98.5
1C	1.17	1.17	1.16	1.18	1.19					
2S	1.17	1.19	1.19	1.20	1.21	99.4	99.3	100.0	100+	100+
2C	1.18	1.20	1.19	1.19	1.20					
3S	1.19	1.18	1.17	1.19	1.18	100+	100+	100.0	100.0	98.4
3C	1.18	1.16	1.17	1.19	1.20					
4S	1.16	1.17	1.18	1.17	1.17	97.6	96.8	100.0	100.0	99.4
4C	1.19	1.21	1.18	1.17	1.18					
5S	1.18	1.17	1.20	1.19	1.20	100+	99.2	100+	100+	100+
5C	1.17	1.18	1.19	1.18	1.18					
6S	1.14	1.16	1.17	1.17	1.16	98.4	98.3	99.2	98.3	99.1
6C	1.16	1.18	1.18	1.19	1.17					
7S	1.16	1.17	1.19	1.19	1.17	97.5	100.0	100+	100+	100+
7C	1.19	1.17	1.18	1.17	1.16					
8S	1.17	1.15	1.17	1.18	1.15	100+	99.3	98.5	98.3	96.7
8C	1.16	1.16	1.19	1.20	1.19					
9S	1.17	1.17	1.19	1.20	1.20	99.0	99.0	100.0	100+	100+
9C	1.18	1.18	1.19	1.16	1.17					
10S	1.19	1.21	1.20	1.19	1.19	100.0	100+	100+	100+	100+
10C	1.19	1.17	1.18	1.17	1.16					

Note: S = Sterilized Cells
C = Control Cells

Separator Screening Tests for Final Sample No. 110

Sample No.	Thickness (Inches)	Resistance (milliohms-in^2)	Dry Length	Dry Width	Wet Length	Wet Width	Wet Thickness	Exchange Capacity (meq/gm)	Tensile Strength (Psi)
1	0.0014	20	6	1 7/16	6 13/16	1 9/16	0.0017	3.58	935
2	0.0016	22	6 1/16	1 7/16	6 13/16	1 9/16	0.0016	3.70	1154
3	0.0016	20	6 1/16	1 7/16	6 1/4	1 9/16	0.0017	3.44	944
4	0.0014	17	6	1 3/8	6 7/8	1 9/16	0.0017	3.22	972
5	0.0015	16	5 15/16	1 7/16	6 9/16	1 9/16	0.0015	3.28	1015
6	0.0016	19	6 1/16	1 7/16	6 15/16	1 9/16	0.0017	3.79	860
7	0.0014	20	6 1/16	1 5/16	7	1 7/16	0.0016	3.29	910
8	0.0015	22	6	1 3/8	6 13/16	1 7/16	0.0017	3.75	1105
9	0.0014	18	5 15/16	1 7/16	6 3/4	1 9/16	0.0017	3.34	797
10	0.0016	16	6 1/16	1 7/16	6 15/16	1 9/16	0.0017	3.45	794

Bibliography

1. Heat Sterilizable Silver-Zinc Battery Investigation, Final Report. R. S. Bogner and J. J. Lander, JPL Study Contract 950364.

2. Lawton, E. V., Balwit, J. S. and Powell, R. S. J. Poly. Sci. 62, 257-290 (1958).

3. Salovey, R., J. Poly. Sci. 61, 463-473 (1962).

4. Polyethylene, A. Renfrew and P. Morgan, Iliffe and Sons, Ltd., London (1960), p. 375.

5. op cit, p. 377.

6. Radiation Chemistry of Polymeric Systems, Adolphe Chapiro, Interscience Publishers, N. Y. (1962), pp. 423, 424.

7. Radiation Chemistry of Organic Compounds, A. J. Swallow, Pergamon Press, New York (1960), pp. 159, 160.

8. Degradation of Vinyl Polymers, H. H. G. Vellinek, Academic Press, Inc., New York (1955) pp. 118-124.

Table 1

Sample Membranes and Designations

Sample No.	Designation	Description
101	JPL/17-1.2/pre 10	density: 0.917 precrosslinked: 10 Mrads
102	JPL/38-0.2/pre 10	density: 0.938 precrosslinked: 10 Mrads
103	JPL/60-0.2/pre 10	density: 0.960 precrosslinked: 10 Mrads
104	JPL/17-1.2/pre 30	density: 0.917 precrosslinked: 30 Mrads
105	JPL/38-0.2/pre 30	density: 0.938 precrosslinked: 30 Mrads
106	JPL/60-0.2/pre 30	density: 0.960 precrosslinked: 30 Mrads
107	JPL/17-1.2/pre 50	density: 0.917 precrosslinked: 50 Mrads
108	JPL/38-0.2/pre 50	density: 0.938 precrosslinked: 50 Mrads
109	JPL/60-0.2/pre 50	density: 0.960 precrosslinked: 50 Mrads
110	JPL/17-1.2/pre 70	density: 0.917 precrosslinked: 70 Mrads
111	JPL/38-0.2/pre 70	density: 0.938 precrosslinked: 70 Mrads
112	JPL/60-0.2/pre 70	density: 0.960 precrosslinked: 70 Mrads
113	JPL/17-1.2/pre DVB-1	density: 0.917 precrosslinked: DVB, level 1
114	JPL/38-0.2/pre DVB-1	density: 0.938 precrosslinked: DVB, level 1

(Continued)

Table 1 (Continued)

Sample No.	Designation	Description
115	JPL/60-0.2/pre DVB-1	density: 0.960 precrosslinked: DVB, level 1
116	JPL/17-1.2/pre DVB-2	density: 0.917 precrosslinked: DVB, level 2
117	JPL/38-0.2/pre DVB-2	density: 0.938 precrosslinked: DVB, level 2
118	JPL/60-0.2/pre DVB-2	density: 0.960 precrosslinked: DVB, level 2
119	JPL/17-1.2/pre DVB-3	density: 0.917 precrosslinked: DVB, level 3
120	JPL/38-0.2/pre DVB-3	density: 0.938 precrosslinked: DVB, level 3
121	JPL/60-0.2/pre DVB-3	density: 0.960 precrosslinked: DVB, level 3
122	JPL/17-1.2/RH-1	density: 0.917 postcrosslinked: R.H., level 1
123	JPL/38-0.2/RH-1	density: 0.938 postcrosslinked: R.H., level 1
124	JPL/60-0.2/RH-1	density: 0.960 postcrosslinked: R.H., level 1
125	JPL/17-1.2/RH-2	density: 0.917 postcrosslinked: R.H., level 2
126	JPL/38-0.2/RH-2	density: 0.938 postcrosslinked: R.H., level 2
127	JPL/60-0.2/RH-2	density: 0.960 postcrosslinked: R.H., level 2
128	JPL/17-1.2/RH-3	density: 0.917 postcrosslinked: R.H., level 3

(Continued)

Table 1 (Continued)

Sample No.	Designation	Description
129	JPL/38-0.2/RH-3	density: 0.938 postcrosslinked: R.H., level 3
130	JPL/60-0.2/RH-3	density: 0.960 postcrosslinked: R.H., level 3
131	JPL/17-1.2/post DVB-1	density: 0.917 postcrosslinked: DVB, level 1
132	JPL/17-1.2/post DVB-2	density: 0.917 postcrosslinked: DVB, level 2
133	JPL/17-1.2/post DVB-3	density: 0.917 postcrosslinked: DVB, level 3
134	JPL/17-1.2/post DVB-4	density: 0.917 postcrosslinked: DVB, level 4
135	JPL/17-1.2/post DVB-5	density: 0.917 postcrosslinked: DVB, level 5
136	JPL/17-1.2/post DVB-6	density: 0.917 postcrosslinked: DVB, level 6
137	JPL/17-1.2/post DVB-7	density: 0.917 postcrosslinked: DVB, level 7
138	JPL/17-1.2/post DVB-8	density: 0.917 postcrosslinked: DVB, level 8
139	JPL/17-1.2/post DVB-9	density: 0.917 postcrosslinked: DVB, level 9
140	JPL/17-1.2/sim DVB-1	density: 0.917 postcrosslinked: DVB-AA, level 1
141	JPL/17-1.2/sim DVB-2	density: 0.917 postcrosslinked: DVB-AA, level 2
142	JPL/17-1.2/sim DVB-3	density: 0.917 postcrosslinked: DVB-AA, level 3

(Continued)

Table 1 (Continued)

Sample No.	Designation	Description
143	JPL/17-1.2/sim DVB-4	density: 0.917 postcrosslinked: DVB-AA, level 4
144	JPL/17-1.2/sim DVB-5	density: 0.917 crosslinked: DVB-AA, level 5
145	JPL/17-1.2/sim DVB-6	density: 0.917 crosslinked: DVB-AA, level 6
146	JPL/17-1.2/sim DVB-7	density: 0.917 crosslinked: DVB-AA, level 7
147	JPL/17-1.2/sim DVB-8	density: 0.917 crosslinked: DVB-AA, level 8
148	JPL/17-1.2/sim DVB-9	density: 0.917 crosslinked: DVB-AA, level 9
149	JPL/17-1.2/ext pre-50	density: 0.917 low M.W. frac. extracted precrosslinked: 50 Mrads
150	JPL/38-0.2/ext pre-50	density: 0.938 low M.W. frac. extracted precrosslinked: 50 Mrads
151	JPL/60-0.2/ext pre-50	density: 0.960 low M. W. frac. extracted precrosslinked: 50 Mrads

Table 2

Preparation of Radiation Precrosslinked Samples
(Nos. 101-112)

Sample No.	Precross-linking Dose (Mrads)	Density	Grafting Solution 1	Total Dose 1 (Mrads)	Dose Rate 1 (Mrads/hr.)	Grafting Solution 2	Total Dose 2 (Mrads)	Dose Rate 2 (Mrads/hr.)
101	10	0.917	70% Benzene 25% Acrylic Acid 5% CCl4	1.01	0.014	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014
102	10	0.938	70% Benzene 25% Acrylic Acid 5% CCl4	1.01	0.014	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014
103	10	0.960	70% Benzene 25% Acrylic Acid 5% CCl4	1.01	0.014	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014
104	30	0.917	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014
105	30	0.938	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014
106	30	0.960	75% Benzene 20% Acrylic Acid 5% CCl4	1.34	0.014	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014

(Continued)

Table 2 (Continued)

Sample No.	Precross-linking Dose (Mrads)	Density	Grafting Solution 1	Total Dose 1 (Mrads)	Dose Rate 1 (Mrads/hr.)	Grafting Solution 2	Total Dose 2 (Mrads)	Dose Rate 2 (Mrads/hr.)
107	50	0.917	75% Benzene 20% Acrylic Acid 5% CC14	1.34	0.014	70% Benzene 25% Acrylic Acid 5% CC14	1.34	0.014
108	50	0.938	75% Benzene 20% Acrylic Acid 5% CC14	1.34	0.014	70% Benzene 25% Acrylic Acid 5% CC14	1.34	0.014
109	50	0.960	70% Benzene 25% Acrylic Acid 5% CC14	1.34	0.014	70% Benzene 25% Acrylic Acid 5% CC14	1.34	0.014
110	70	0.917	70% Benzene 25% Acrylic Acid 5% CC14	1.04	0.015	70% Benzene 25% Acrylic Acid 5% CC14	1.34	0.014
111	70	0.938	70% Benzene 25% Acrylic Acid 5% CC14	1.04	0.015	70% Benzene 25% Acrylic Acid 5% CC14	1.34	0.014
112	Sample not acceptable							

Table 3

Preparation of Divinyl Benzene Precrosslinked Samples
(Nos. 113-121)

Sample No.	Crosslinking Solution	Dose Rate (Mrads/hr)	Total Dose (Mrads)	Grafting Solution	Dose Rate (Mrads/hr)	Total Dose (Mrads)	Base Polymer Density
113	0.5% DVB 0.5% Benzene 99% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.917
114	0.5% DVB 0.5% Benzene 99% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.938
115	0.5% DVB 0.5% Benzene 99% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.960
116	1.0% DVB 1.0% Benzene 98% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.917
117	1.0% DVB 1.0% Benzene 98% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.938
118	1.0% DVB 1.0% Benzene 98% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.960
119	1.5% DVB 1.5% Benzene 97% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.917
120	1.5% DVB 1.5% Benzene 97% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.938
121	1.5% DVB 1.5% Benzene 97% Methanol	0.03	0.55	25% Acrylic Acid 70% Benzene 5% CCl4	0.02	1.43	0.960

Table 4

Preparation of Membranes Postcrosslinked at Various Relative Humidity Levels
(Nos. 122-130)

Sample No.	Density	Grafting Solution	Total Dose (Mrads)	Dose Rate (Mrads/hr)	Crosslinking R.H.	Crosslinking Dose (Mrads)	Crosslinking Dose Rate (Mrads/hr)
122	0.917	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	10	4.50	0.03
123	0.938	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	10	4.50	0.03
124	0.960	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	10	4.50	0.03
125	0.917	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	50	4.50	0.03
126	0.938	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	50	4.50	0.03
127	0.960	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	50	4.50	0.03
128	0.917	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	95	4.50	0.03
129	0.938	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	95	4.50	0.03
130	0.960	25% Acrylic Acid 70% Benzene 5% CCl4	1.34	0.014	95	4.50	0.03

Table 5

Preparation of Membranes Postcrosslinked with Divinyl Benzene (DVB)
(Nos. 131-139)

Sample No.	Grafting Solution	Dose Rate (Mrads/hr)	Total Dose (Mrads)	Crosslinking	Dose Rate (Mrads/hr)	Total Dose (Mrads)	Density
131	15% Acrylic Acid 80% Benzene 5% CCl4	0.014	1.68	0.5% DVB 0.5% Benzene 99.0% Methanol	0.03	0.58	0.917
132	20% Acrylic Acid 75% Benzene 5% CCl4	0.014	1.68	0.5% DVB 0.5% Benzene 99.0% Methanol	0.03	0.58	0.917
133	25% Acrylic Acid 70% Benzene 5% CCl4	0.014	1.68	0.5% DVB 0.5% Benzene 99.0% Methanol	0.03	0.58	0.917
134	15% Acrylic Acid 80% Benzene 5% CCl4	0.014	1.68	1.0% DVB 1.0% Benzene 98.0% Methanol	0.03	0.58	0.917
135	20% Acrylic Acid 75% Benzene 5% CCl4	0.014	1.68	1.0% DVB 1.0% Benzene 98.0% Methanol	0.03	0.58	0.917
136	25% Acrylic Acid 70% Benzene 5% CCl4	0.014	1.68	1.0% DVB 1.0% Benzene 98.0% Methanol	0.03	0.58	0.917
137	15% Acrylic Acid 80% Benzene 5% CCl4	0.014	1.68	1.5% DVB 1.5% Benzene 97.0% Methanol	0.03	0.58	0.917
138	20% Acrylic Acid 75% Benzene 5% CCl4	0.014	1.68	1.5% DVB 1.5% Benzene 97.0% Methanol	0.03	0.58	0.917
139	25% Acrylic Acid 70% Benzene 5% CCl4	0.014	1.68	1.5% DVB 1.5% Benzene 97.0% Methanol	0.03	0.58	0.917

Table 6

Preparation of Membranes Simultaneously Grafted with Acrylic Acid and Divinyl Benzene (DVB) (Nos. 140-148)

Sample No.	Density PE	Grafting Solution (Vol. %) DVB	AA	CCl4	Benzene	Dose Rate (Mrads/hr)	Total Dose (Mrads)
140	0.917	0.30	24.70	5.0	70	0.018	1.23
141	0.917	0.40	24.60	5.0	70	0.018	1.23
142	0.917	0.50	24.50	5.0	70	0.018	1.23
143	0.917	0.60	24.40	5.0	70	0.018	2.16
144	0.917	0.70	24.30	5.0	70	0.018	2.59
145	0.917	0.80	24.20	5.0	70	0.018	2.59
146	0.917	0.90	24.10	5.0	70	0.018	2.59
147	0.917	0.95	24.05	5.0	70	0.018	2.59
148	0.917	1.00	24.00	5.0	70	0.018	3.08

Table 7

Preparation of Membranes Prepared from Fractionated Polyethylene (Nos. 149-151)

Sample No.	Density	M.W. of P.E. Removed	M.W. of P.E. Remaining	*Time (sec) (lean phase)	*Time (sec) (Gel Phase)	Precross-linking Dose(Mrads)	**Grafting Solution	**Total Dose (Mrads)	Dose** Rate (Mr/Hr)
149	0.917	26,700	33,400	105.2	117.4	50	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014
150	0.938	8,700	47,000	78.4	146.6	50	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014
151	0.960	7,600	53,000	77.0	161.8	50	70% Benzene 25% Acrylic Acid 5% CCl4	1.34	0.014

*These values are employed to calculate M.W. by the following equations:

$$\overline{M_W} = \frac{K_{cm} \log_{10} \eta_r}{C} \quad \text{and} \quad \eta_r = \frac{\eta}{\eta_o} \quad \text{where} \quad \overline{M_W} = \text{weight average molecular weight}$$

$$\frac{\eta}{\eta_o} = \frac{T}{T_o} \qquad \eta_r = \text{relative viscosity}$$

C = base molar concentration of polymer in tetralin

K_{cm} = 4.03×10^{-4} g/l at 130°C

η = solution viscosity

η_o = solvent viscosity

$T_{solvent}$ = 68.0 sec.

**These conditions apply to three grafting procedures

Table 8

Weight and Dry Thickness Measurements

Sample No.	Weight (gms)	Thickness (Inches)	Length (Inches)	Width (Inches)
101A	0.1635	0.0020	5 1/4	1 5/16
101B	0.1685	0.0020	5 1/4	1 3/8
102A	0.1209	0.0016	5 7/8	1 7/16
102B	0.1373	0.0015	5 13/16	1 1/2
103A	0.1459	0.0016	5 15/16	1 1/2
103B	0.1700	0.0015	6 1/16	1 9/16
104A	0.2210	0.0020	5 13/16	1 3/8
104B	0.2383	0.0020	5 3/4	1 7/16
105A	0.1045	0.0012	5 3/4	1 1/2
105B	0.0986	0.0011	5 13/16	1 1/2
106A	0.1541	0.0021	5 3/8	1 7/16
106B	0.1373	0.0020	5 7/16	1 7/16
107A	0.2069	0.0020	5 3/4	1 7/16
107B	0.2206	0.0017	5 3/4	1 7/16
108A	0.1198	0.0012	5 3/8	1 7/16
108B	0.1094	0.0012	5 7/16	1 3/8
109A	0.1487	0.0022	6	1 3/8
109B	0.1514	0.0023	6	1 7/16
110A	0.1737	0.0021	5 7/16	1 7/16
110B	0.1799	0.0020	6 1/8	1 7/16

Table 8 (Continued)

Wet and Dry Thickness Measurements

Sample No.	Weight (gms)	Thickness (Inches)	Length (Inches)	Width (Inches)
111A	0.1875	0.0025	5 7/8	1 1/2
111B	0.1715	0.0025	5 7/8	1 7/16
112A	Sample not tested - high resistance			
112B	Sample not tested - high resistance			
113A	0.2207	0.0016	5 11/16	1 7/16
113B	0.2532	0.0016	5 11/16	1 7/16
114A	0.0973	0.0010	6 1/16	1 1/2
114B	0.1257	0.0011	6 1/16	1 1/2
115A	0.1818	0.0017	6	1 1/2
115B	0.1701	0.0018	6	1 1/2
116A	0.2445	0.0016	5 13/16	1 1/2
116B	0.2533	0.0016	5 7/8	1 1/2
117A	0.1018	0.0009	6 1/16	1 1/2
117B	0.1093	0.0009	6 1/16	1 1/2
118A	0.1576	0.0018	6	1 7/16
118B	0.1770	0.0018	6	1 1/2
119A	0.2208	0.0015	5 11/16	1 7/16
119B	0.2554	0.0015	6	1 1/2
120A	0.1547	0.0012	6 1/16	1 1/2
120B	0.1115	0.0009	6 1/8	1 9/16

Table 8 (Continued)

Wet and Dry Thickness Measurements

Sample No.	Weight (gms)	Thickness (Inches)	Length (Inches)	Width (Inches)
121A	0.1577	0.0017	5 15/16	1 1/2
121B	0.1606	0.0017	5 15/16	1 1/2
122A	0.1766	0.0013	5 13/16	1 7/16
122B	0.1710	0.0012	5 5/8	1 7/16
123A	0.1321	0.0016	5 13/16	1 1/2
123B	0.1290	0.0013	5 13/16	1 1/2
124A	0.1266	0.0014	5 7/8	1 1/2
124B	0.1618	0.0017	5 15/16	1 1/2
125A	0.2099	0.0015	6	1 1/2
125B	0.2204	0.0018	6	1 1/2
126A	0.0956	0.0008	6	1 1/2
126B	0.0893	0.0008	6	1 1/2
127A	0.1668	0.0016	6	1 1/2
127B	0.1651	0.0016	6	1 1/2
128A	0.1866	0.0016	6	1 1/2
128B	0.1857	0.0016	6	1 1/2
129A	0.1021	0.0009	6	1 1/2
129B	0.1036	0.0009	6	1 1/2
130A	0.1630	0.0017	6	1 1/2
130B	0.1643	0.0017	6	1 1/2

Table 8 (Continued)

Wet and Dry Thickness Measurements

Sample No.	Weight (gms)	Thickness (Inches)	Length (Inches)	Width (Inches)
131A	0.1594	0.0016	5 13/16	1 8/16
131B	0.1577	0.0016	5 12/16	1 7/16
132A	0.2159	0.0023	5 13/16	1 8/16
132B	0.2088	0.0025	5 11/16	1 8/16
133A	0.1902	0.0018	5 7/16	1 7/16
133B	0.1829	0.0018	5 8/16	1 6/16
134A	0.1749	0.0018	5 11/16	1 7/16
134B	0.1679	0.0017	5 10/16	1 7/16
135A	0.1987	0.0023	5 11/16	1 8/16
135B	0.2068	0.0020	5 13/16	1 8/16
136A	0.1342	0.0021	5 5/16	1 5/16
136B	0.1963	0.0021	5 5/16	1 7/16
137A	0.1614	0.0015	5 12/16	1 8/16
137B	0.1623	0.0015	5 12/16	1 8/16
138A	0.2169	0.0023	5 14/16	1 8/16
138B	0.1975	0.0020	5 12/16	1 7/16
139A	0.1890	0.0020	5 5/16	1 6/16
139B	0.1883	0.0018	5 6/16	1 7/16
140A	0.2212	0.0035	5 7/8	1 7/16
140B	0.2236	0.0034	5 11/16	1 7/16

Table 8 (Continued)

Wet and Dry Thickness Measurements

Sample No.	Weight (gms)	Thickness (Inches)	Length (Inches)	Width (Inches)
141A	0.2008	0.0014	5 15/16	1 1/2
141B	0.1779	0.0013	5 7/8	1 1/2
142A	0.2275	0.0018	6 1/8	1 9/16
142B	0.2189	0.0015	6 1/16	1 9/16
143A	0.2018	0.0022	5 7/8	1 7/16
143B	0.1945	0.0018	5 13/16	1 1/2
144A	0.1875	0.0016	5 13/16	1 1/2
144B	0.1855	0.0015	5 7/8	1 7/16
145A	0.2199	0.0018	5 13/16	1 1/2
145B	0.2195	0.0018	5 13/16	1 1/2
146A	0.1985	0.0018	5 11/16	1 1/2
146B	0.2111	0.0017	5 13/16	1 7/16
147A	0.2813	0.0022	5 7/8	1 9/16
147B	0.2428	0.0022	5 7/8	1 1/2
148A	0.2189	0.0025	5 7/8	1 7/16
148B	0.2143	0.0027	5 15/16	1 1/2
149A	Sample not tested - degraded during grafting			
149B	" " " " " "			
150A	" " " " " "			
150B	" " " " " "			
151A	" " " " " "			
151B	" " " " " "			

Table 9

Electrical Resistance in 40% KOH

Sample No.	Resistance (milliohms-in^2)	Sample No.	Resistance (milliohms-in^2)
101A	33	101B	38
102A	26	102B	26
103A	80	103B	77
104A	30	104B	27
105A	40	105B	42
106A	44	106B	39
107A	55	107B	49
108A	45	108B	41
109A	88	109B	78
110A	45	110B	41
111A	54	111B	54
112A	>1000	112B	>1000
113A	39	113B	39
114A	28	114B	28
115A	83	115B	83
116A	30	116B	30
117A	30	117B	30
118A	127	118B	127
119A	35	119B	35
120A	44	120B	44
121A	30	121B	30

Table 9 (Continued)

Electrical Resistance in 40% KOH

Sample No.	Resistance (milliohms-in^2)	Sample No.	Resistance (milliohms-in^2)
122A	48	122B	54
123A	32	123B	37
124A	54	124B	51
125A	35	125B	33
126A	26	126B	30
127A	38	127B	35
128A	50	128B	52
129A	50	129B	50
130A	60	130B	56
131A	520	131B	520
132A	62	132B	62
133A	24	133B	24
134A	129	134B	129
135A	96	135B	98
136A	36	136B	36
137A	398	137B	398
138A	64	138B	74
139A	30	139B	26
140A	111	140B	116
141A	74	141B	79

Table 9 (Continued)

Electrical Resistance in 40% KOH

Sample No.	Resistance (milliohms-in^2)	Sample No.	Resistance (milliohms-in^2)
142A	56	142B	65
143A	34	143B	41
144A	216	144B	216
145A	70	145B	42
146A	38	146B	34
147A	36	147B	42
148A	95	148B	95
149A	>500	149B	>500
150A	>500	150B	>500
151A	>500	151B	>500

Table 10

Swelling (Change of Physical Dimensions due to Wetting with 40% KOH)

(Dry dimensions are recorded in Table 8)

Sample No.	Wet Length (Inches)	Wet Width (Inches)	Wet Thickness (Inches)
101A	5 7/16	1 3/8	0.0016
101B	5 7/16	1 7/16	0.0018
102A	6 1/8	1 1/2	0.0019
102B	6 1/4	1 9/16	0.0019
103A	6 3/16	1 9/16	0.0015
103B	6 1/2	1 5/8	0.0018
104A	6 1/4	1 7/16	0.0013
104B	6 1/4	1 1/2	0.0016
105A	6 3/16	1 1/2	0.0012
105B	6 3/16	1 1/2	0.0012
106A	6	1 1/2	0.0015
106B	6 1/16	1 7/16	0.0014
107A	6 1/8	1 1/2	0.0017
107B	6 3/16	1 5/8	0.0019
108A	6	1 1/2	0.0012
108B	6 1/16	1 7/16	0.0013

Table 10 (Continued)

Swelling (Change of Physical Dimensions due to Wetting with 40% KOH)

Sample No.	Wet Length (Inches)	Wet Width (Inches)	Wet Thickness (Inches)
109A	6 3/16	1 7/16	0.0016
109B	6 3/16	1 1/2	0.0019
110A	6 1/4	1 1/2	0.0016
110B	6 1/2	1 1/2	0.0016
111A	6 1/2	1 11/16	0.0019
111B	6 5/16	1 5/8	0.0018
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	5 9/16	1 9/16	0.0020
113B	6 1/4	1 5/8	0.0025
114A	6 5/16	1 7/16	0.0020
114B	6 1/4	1 1/2	0.0015
115A	6 1/4	1 1/2	0.0020
115B	6 1/4	1 1/2	0.0023
116A	6 1/4	1 1/2	0.0022
116B	6 3/8	1 9/16	0.0022
117A	6 1/8	1 1/2	0.0014
117B	6 5/16	1 1/2	0.0013
118A	6	1 7/16	0.0020
118B	6 1/8	1 1/2	0.0023

Table 10 (Continued)

Swelling (Change of Physical Dimensions due to Wetting with 40% KOH)

Sample No.	Wet Length (Inches)	Wet Width (Inches)	Wet Thickness (Inches)
119A	6	1 1/2	0.0021
119B	6 9/16	1 9/16	0.0018
120A	6 3/8	1 1/2	0.0018
120B	6 5/16	1 9/16	0.0017
121A	6	1 1/2	0.0018
121B	6	1 9/16	0.0018
122A	5 7/8	1 7/16	0.0014
122B	5 13/16	1 7/16	0.0014
123A	5 13/16	1 9/16	0.0014
123B	5 13/16	1 5/8	0.0014
124A	5 15/16	1 1/2	0.0014
124B	6	1 1/2	0.0015
125A	6 5/8	2 1/16	0.0015
125B	6 1/2	2	0.0013
126A	6	1 1/2	0.0011
126B	6	1 1/2	0.0011
127A	6 3/8	1 5/8	0.0014
127B	6 1/4	1 1/2	0.0013
128A	6 3/8	1 9/16	0.0011
128B	6 1/4	1 9/16	0.0011

Table 10 (Continued)

Swelling (Change of Physical Dimensions due to Wetting with 40% KOH)

Sample No.	Wet Length (Inches)	Wet Width (Inches)	Wet Thickness (Inches)
129A	6 1/16	1 5/8	0.0011
129B	6 1/8	1 5/8	0.0011
130A	6 1/8	1 5/8	0.0014
130B	6 3/16	1 5/8	0.0014
131A	7	1 9/16	0.0016
131B	6 15/16	1 1/2	0.0016
132A	6 1/16	1 1/2	0.0018
132B	5 15/16	1 9/16	0.0017
133A	5 7/8	1 1/2	0.0014
133B	5 13/16	1 7/16	0.0014
134A	5 3/4	1 1/2	0.0015
134B	5 7/8	1 7/16	0.0014
135A	5 7/8	1 1/2	0.0020
135B	6 1/16	1 1/2	0.0018
136A	5 11/16	1 3/8	0.0018
136B	5 5/8	1 7/16	0.0017
137A	5 7/8	1 1/2	0.0012
137B	5 7/8	1 9/16	0.0013
138A	6 1/4	1 9/16	0.0015
138B	6 1/8	1 9/16	0.0014

Table 10 (Continue)

Sample No.	Swelling (Change of Physical Dimensions due to Wetting with 40% KOH) Wet Length (Inches)	Wet Width (Inches)	Wet Thickness (Inches)
139A	5 3/4	1 1/2	0.0016
139B	5 3/4	1 1/2	0.0016
140A	6 1/4	1 1/2	0.0028
140B	6 1/16	1 9/16	0.0028
141A	6 13/16	1 5/8	0.0015
141B	6 3/4	1 5/8	o.0014
142A	6 1/2	1 11/16	0.0016
142B	6 7/16	1 11/16	0.0015
143A	6 1/16	1 1/2	0.0020
143B	6	1 1/2	0.0016
144A	6	1 1/2	0.0017
144B	6	1 1/2	0.0017
145A	6 3/16	1 9/16	0.0017
145B	6 1/4	1 5/8	0.0017
146A	6 1/8	1 9/16	0.0014
146B	6 3/16	1 1/2	0.0016
147A	6 1/2	1 3/4	0.0019
147B	6 3/8	1 5/8	0.0013
148A	6 3/16	1 9/16	0.0017
148B	6 1/4	1 5/8	0.0016
149A	Sample not tested - degraded during grafting		
149B	" "	" "	" "
150A	" "	" "	" "
150B	" "	" "	" "
151A	" "	" "	" "
151B	" "	" "	" "

Table 11

Exchange Capacities of Unsterilized Sample Membranes

Sample No.	Exchange Capacity (meq/gm)	Weight-Area Ratio (gms/in^2)	Exchange Capacity (meq/in^2)
101A	6.36	0.0237	0.1507
101B	6.83	0.0205	0.1400
102A	5.76	0.0143	0.0824
102B	6.01	0.0157	0.0944
103A	4.50	0.0164	0.0738
103B	4.54	0.0164	0.0745
104A	5.63	0.0277	0.1560
104B	6.16	0.0305	0.1879
105A	5.08	0.0121	0.0615
105B	4.72	0.0113	0.0533
106A	3.50	0.0199	0.0698
106B	3.96	0.0176	0.0697
107A	5.46	0.0250	0.1365
107B	5.46	0.0267	0.1460
108A	4.69	0.0155	0.0727
108B	4.43	0.0146	0.0647
109A	2.75	0.0180	0.0495
109B	2.89	0.0176	0.0509
110A	4.21	0.0222	0.0935
110B	4.29	0.0204	0.0875

Table 11 (Continued)

Exchange Capacities of Unsterilized Sample Membranes

Sample No.	Exchange Capacity (meq/gm)	Weight-Area Ratio (gms/in^2)	Exchange Capacity (meq/in^2)
111A	7.22	0.0213	0.1538
111B	7.39	0.0203	0.1500
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	6.44	0.0270	0.1739
113B	7.21	0.0310	0.2235
114A	5.90	0.0107	0.0631
114B	5.20	0.0138	0.0718
115A	5.83	0.0202	0.1178
115B	5.58	0.0189	0.1055
116A	6.65	0.0280	0.1862
116B	6.69	0.0287	0.1920
117A	3.90	0.0112	0.0437
117B	3.57	0.0120	0.0428
118A	5.04	0.0183	0.0922
118B	4.73	0.0197	0.0932
119A	5.51	0.0270	0.1488
119B	4.98	0.0284	0.1414
120A	5.57	0.0170	0.0947
120B	3.91	0.0116	0.0443

Table 11 (Continued)

Exchange Capacities of Unsterilized Sample Membranes

Sample No.	Exchange Capacity (meq/gm)	Weight-Area Ratio (gms/in^2)	Exchange Capacity (meq/in^2)
121A	3.82	0.0177	0.6676
121B	3.68	0.0180	0.0662
122A	3.66	0.0211	0.0772
122B	3.44	0.0212	0.0729
123A	8.70	0.0151	0.1314
123B	8.74	0.0148	0.1294
124A	2.97	0.0144	0.0428
124B	3.40	0.0182	0.0619
125A	3.71	0.0233	0.0864
125B	4.07	0.0245	0.0997
126A	2.77	0.0106	0.0294
126B	2.50	0.0099	0.0248
127A	3.80	0.0185	0.0703
127B	3.57	0.0183	0.0653
128A	4.46	0.0207	0.0923
128B	4.26	0.0206	0.0878
129A	4.22	0.0113	0.0477
129B	4.21	0.0115	0.0484
130A	4.34	0.0181	0.0786
130B	4.27	0.0183	0.0781
131A	2.82	0.0183	0.0516

Table 11 (Continued)

Exchange Capacities of Unsterilized Sample Membranes

Sample No.	Exchange Capacity (meq/gm)	Weight-Area Ratio (gms/in^2)	Exchange Capacity (meq/in^2)
131B	2.82	0.0191	0.0539
132A	3.84	0.0247	0.0948
132B	3.46	0.0245	0.0848
133A	4.66	0.0243	0.1132
133B	4.63	0.0242	0.1120
134A	3.23	0.0214	0.0691
134B	2.69	0.0208	0.0560
135A	2.94	0.0237	0.0697
135B	3.43	0.0237	0.0813
136A	4.31	0.0193	0.0832
136B	4.40	0.0251	0.1104
137A	2.29	0.0187	0.0428
137B	2.26	0.0188	0.0425
138A	3.75	0.0246	0.0923
138B	3.69	0.0240	0.0886
139A	4.68	0.0244	0.1142
139B	4.58	0.0259	0.1186
140A	3.49	0.0262	0.0914
140B	3.73	0.0274	0.1022
141A	3.73	0.0226	0.0843
141B	3.59	0.0202	0.0725
142A	3.43	0.0238	0.0816

Table 11 (Continued)

Exchange Capacities of Unsterilized Sample Membranes

Sample No.	Exchange Capacity (meq/gm)	Weight-Area Ratio (gms/in^2)	Exchange Capacity (meq/in^2)
142B	3.30	0.0231	0.0762
143A	4.51	0.0239	0.1078
143B	4.67	0.0223	0.1041
144A	3.17	0.0215	0.0682
144B	3.19	0.0220	0.0702
145A	3.93	0.0252	0.0990
145B	4.64	0.0252	0.1169
146A	4.98	0.0233	0.1160
146B	4.96	0.0247	0.1225
147A	6.05	0.0306	0.1851
147B	5.38	0.0276	0.1485
148A	3.76	0.0259	0.0974
148B	4.13	0.0241	0.0995
149A	Sample not tested - degraded during grafting		
149B	" " " " " "		
150A	" " " " " "		
150B	" " " " " "		
151A	" " " " " "		
151B	" " " " " "		

Table 12

Tensile Strength Measurements of Unsterilized Samples
(Values are an average of two measurements)

Sample No.	Tensile Strength (psi)
101	1790
102	290
103	1070
104	735
105	557
106	1381
107	1013
108	891
109	847
110	1002
111	371
112	Sample not tested - high resistance
113	775
114	1224
115	759
116	852
117	954
118	933
119	578
120	306

Table 12 (Continued)

Tensile Strength Measurements of Unsterilized Samples

Sample No.	Tensile Strength (psi)
121	1261
122	764
123	191
124	481
125	998
126	334
127	794
128	1203
129	539
130	1119
131	752
132	868
133	859
134	1246
135	936
136	1187
137	1116
138	712
139	669
140	637

Table 12 (Continued)

Tensile Strength Measurements of Unsterilized Samples

Sample No.	Tensile Strength (psi)
141	1106
142	1420
143	861
144	1104
145	1143
146	1290
147	1181
148	1339
149	Sample not tested -degraded during grafting
150	" " " " " "
151	" " " " " "

Table 13

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 145°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
101A	19.84	17.23	19.42
101B	17.84	19.42	20.08
102A	12.23	12.64	12.30
102B	11.14	11.07	13.41
103A	2.12	2.00	2.70
103B	3.17	2.14	2.93
104A	2.71	2.13	2.42
104B	2.44	2.26	2.97
105A	6.13	6.35	7.23
105B	5.19	6.21	5.41
106A	8.40	8.13	8.18
106B	8.27	7.67	8.11
107A	1.65	1.72	1.87
107B	1.40	1.97	1.83
108A	3.90	3.91	4.71
108B	3.67	4.15	4.42
109A	3.65	3.84	3.95
109B	3.66	3.59	3.27
110A	3.51	3.66	3.70
110B	3.15	3.59	3.53

Table 13 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 145°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
111A	7.11	8.28	9.49
111B	8.48	9.17	8.44
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	9.31	7.96	14.70
113B	11.11	9.23	12.00
114A	6.01	13.73	10.84
114B	7.72	10.41	9.92
115A	1.80	2.76	8.22
115B	5.16	4.55	6.26
116A	3.72	6.38	7.45
116B	4.07	3.93	5.78
117A	5.29	8.04	8.10
117B	7.73	8.24	8.12
118A	2.03	3.39	1.70
118B	3.41	3.33	3.99
119A	6.45	9.89	5.84
119B	7.03	8.40	8.19
120A	5.33	7.22	7.05
120B	4.72	7.52	6.00

Table 13 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 145oC

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
121A	0.14	2.56	0.33
121B	2.33	2.78	1.81
122A	28.14	27.31	29.48
122B	22.34	29.59	27.64
123A	29.73	26.45	28.91
123B	22.64	27.38	29.45
124A	27.60	28.42	27.78
124B	24.44	26.58	25.19
125A	19.84	21.40	21.97
125B	21.43	20.33	20.74
126A	20.50	20.93	21.44
126B	19.73	24.23	22.38
127A	17.11	17.20	14.51
127B	13.04	19.55	12.13
128A	10.97	15.74	13.64
128B	11.18	12.29	14.71
129A	10.90	11.22	11.50
129B	12.43	13.97	14.36
130A	6.96	9.07	7.80
130B	8.45	10.47	8.93

Table 13 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 145°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	14.36	11.67	16.34
132B	9.71	12.41	11.92
133A	11.63	9.31	17.11
133B	17.42	16.23	12.43
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested - high resistance after sterilization		
135B	" " " " " " "		
136A	17.32	12.46	12.92
136B	19.28	16.18	16.32
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	16.11	11.66	9.76
138B	9.36	12.44	14.87
139A	13.14	12.13	16.29
139B	18.00	9.42	11.11
140A	7.92	8.41	7.12
140B	9.61	9.39	8.47

Table 13 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 145°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
141A	7.30	8.61	12.33
141B	9.17	4.78	8.13
142A	7.84	12.18	6.11
142B	9.04	3.98	8.27
143A	3.92	4.81	2.78
143B	4.21	3.22	2.49
144A	7.13	4.44	8.21
144B	3.68	9.96	7.39
145A	2.79	4.03	1.82
145B	3.71	3.17	2.21
146A	2.14	3.12	1.80
146B	4.33	2.28	2.01
147A	1.11	0.71	3.24
147B	2.49	2.33	1.86
148A	3.88	2.16	4.18
148B	3.77	3.48	1.67
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 14

Weight Loss (%) of Samples due to Thermal Sterilization in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	18.34	19.92	19.51
101B	19.12	17.38	18.92
102A	12.36	12.78	13.10
102B	12.42	11.86	12.67
103A	2.41	2.61	2.91
103B	2.34	2.88	2.58
104A	2.12	2.83	2.64
104B	2.25	2.51	2.38
105A	6.18	6.79	7.35
105B	6.30	6.44	7.02
106A	8.23	8.57	8.36
106B	7.98	8.73	8.69
107A	1.76	1.52	1.93
107B	1.47	1.59	1.86
108A	4.23	4.62	3.98
108B	4.17	4.78	4.91
109A	3.52	3.97	3.74
109B	3.56	4.11	4.08
110A	3.20	3.17	3.74
110B	3.39	2.90	3.26

Table 14 (Continued)

Weight Loss (%) of Samples due to Thermal Sterilization 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	7.41	8.72	9.14
111B	7.29	7.96	9.01
112A	Sample not tested - high resistance		
112B	" "	" "	"
113A	10.16	8.74	9.48
113B	8.81	9.33	10.03
114A	9.73	12.13	11.43
114B	11.57	9.98	12.27
115A	2.07	3.89	6.91
115B	3.11	3.72	5.14
116A	3.04	7.07	8.21
116B	2.96	6.84	8.30
117A	7.73	8.16	7.92
117B	7.45	7.77	8.38
118A	3.14	1.53	2.38
118B	1.59	3.07	3.16
119A	10.02	7.28	6.28
119B	7.34	6.21	7.43
120A	6.67	7.08	7.53
120B	5.92	6.87	7.24
121A	0.51	0.70	2.01

Table 14 (Continued)

Weight Loss (%) of Samples due to Thermal Sterilization in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1	Ster. No. 2	Ster. No. 3
121B	0.96	0.87	1.03
122A	27.78	28.88	28.10
122B	26.93	30.02	28.55
123A	26.13	29.07	27.23
123B	27.28	28.13	29.45
124A	28.63	27.59	26.85
124B	27.32	26.67	28.91
125A	20.76	21.32	22.06
125B	20.54	21.77	23.88
126A	20.13	20.98	20.51
126B	20.74	20.36	21.04
127A	16.83	17.44	16.29
127B	17.12	17.39	17.56
128A	12.18	16.02	14.91
128B	14.18	14.82	15.06
129A	11.10	10.96	11.73
129B	11.07	11.33	11.87
130A	8.23	9.77	8.89
130B	8.36	8.71	8.96
131A	Sample not tested - high resistance		
131B	" " " " "		

Table 14 (Continued)

Weight Loss (%) of Samples due to Thermal Sterilization in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1	Ster. No. 2	Ster. No. 3
132A	11.41	12.11	17.14
132B	16.32	7.28	13.62
133A	12.37	11.22	12.13
133B	9.42	7.89	11.66
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	" " " " "		
135B	" " " " "		
136A	18.24	19.36	20.22
136B	12.17	17.31	11.42
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	12.13	14.16	15.77
138B	19.21	11.21	17.42
139A	12.28	13.73	19.23
139B	18.77	15.46	17.15
140A	10.02	7.43	11.16
140B	9.38	12.21	9.35
141A	7.71	9.37	6.77
141B	10.45	5.42	9.32
142A	7.40	5.94	7.76
142B	8.13	10.02	6.30

Table 14 (Continued)

Weight Loss (%) of Samples due to Thermal Sterilization in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1	Ster. No. 2	Ster. No. 3
143A	4.22	3.26	3.31
143B	2.18	2.31	4.02
144A	6.21	8.28	9.73
144B	5.36	7.55	7.46
145A	3.03	4.15	3.88
145B	3.62	3.79	4.94
146A	2.21	1.75	1.54
146B	2.70	1.86	3.25
147A	2.40	1.74	0.90
147B	1.01	1.09	1.44
148A	3.72	2.70	3.15
148B	1.49	3.22	4.60
149A	Sample not tested - degraded during grafting		
149B	" " " " " "		
150A	" " " " " "		
150B	" " " " " "		
151A	" " " " " "		
151B	" " " " " "		

Table 15

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
101A	19.41	17.20	15.47
101B	21.10	16.63	18.75
102A	18.40	19.11	16.27
102B	13.00	11.84	14.30
103A	2.36	0.22	1.60
103B	4.15	3.94	2.73
104A	9.80	5.60	8.15
104B	4.08	3.94	2.72
105A	11.43	7.32	12.13
105B	3.78	6.54	8.15
106A	2.02	9.17	7.26
106B	2.26	2.78	0.64
107A	3.18	4.73	3.66
107B	3.23	3.82	1.95
108A	1.12	2.41	1.46
108B	5.62	0.35	2.72
109A	4.18	2.18	3.14
109B	5.63	8.00	2.66
110A	11.20	10.12	8.24
110B	14.53	7.17	9.45

Table 15 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
111A	2.10	1.03	3.18
111B	0.40	0.36	10.32
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	4.21	5.73	7.18
113B	3.06	7.48	5.23
114A	12.84	11.28	17.12
114B	16.13	10.55	12.92
115A	1.12	0.24	11.16
115B	0.74	0.82	0.82
116A	7.11	4.32	11.12
116B	6.30	5.71	10.80
117A	11.02	7.12	14.38
117B	9.66	11.48	12.87
118A	1.76	1.45	0.13
118B	0.73	0.19	0.23
119A	7.13	3.10	9.66
119B	6.08	4.86	10.17
120A	4.15	2.30	8.12
120B	5.54	9.46	11.22

Table 15 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
121A	2.43	1.90	8.21
121B	0.77	5.08	4.44
122A	20.17	21.03	22.14
122B	24.23	25.14	28.12
123A	24.05	23.18	26.27
123B	23.11	29.16	28.08
124A	20.14	21.61	23.42
124B	19.45	22.58	25.31
125A	20.70	17.12	23.28
125B	25.15	23.16	20.22
126A	21.41	27.14	26.94
126B	16.68	27.44	25.14
127A	19.65	27.30	26.44
127B	10.02	19.20	16.77
128A	19.12	27.10	25.81
128B	18.84	23.10	19.70
129A	12.43	17.66	12.83
129B	10.61	13.00	11.22
130A	11.42	17.92	16.15
130B	10.88	5.63	10.50

Table 15 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	12.26	13.96	16.39
132B	11.41	17.17	15.14
133A	13.17	11.40	19.33
133B	9.42	18.96	13.87
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested - high resistance after sterilization		
135B	" " " " " " "		
136A	16.33	18.93	18.11
136B	19.18	14.72	12.38
137A	Sample not tested		
137B	" " "		
138A	20.14	23.27	25.05
138B	15.25	21.14	23.33
139A	11.82	16.32	12.42
139B	15.40	17.50	23.97
140A	12.17	13.14	15.15
140B	8.23	9.25	7.17
141A	9.22	11.13	13.56
141B	9.14	8.21	3.10

Table 15 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
142A	7.00	9.37	10.47
142B	4.70	5.13	7.81
143A	2.11	3.14	2.48
143B	3.73	1.36	0.29
144A	7.13	9.13	16.04
144B	6.80	8.17	11.12
145A	1.91	2.16	1.93
145B	0.74	11.61	4.22
146A	1.82	1.14	2.25
146B	2.00	3.06	2.03
147A	0.31	1.71	1.04
147B	0.94	1.80	1.21
148A	4.21	7.14	6.25
148B	4.36	5.18	6.17
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 16

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
101A	18.34	19.25	17.17
101B	20.12	16.52	17.34
102A	15.58	15.17	17.51
102B	18.67	16.41	13.36
103A	4.63	1.41	2.45
103B	1.60	0.94	1.72
104A	3.16	2.79	9.68
104B	7.21	10.40	10.55
105A	10.67	8.08	9.24
105B	5.40	5.83	6.15
106A	7.13	4.15	3.17
106B	3.24	4.23	5.49
107A	3.24	3.50	4.12
107B	3.71	1.74	2.03
108A	4.34	3.66	5.32
108B	5.33	2.16	5.14
109A	6.22	2.86	5.23
109B	3.12	3.76	6.01
110A	9.34	11.61	9.74
110B	10.25	10.42	12.47

Table 16 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
111A	2.34	4.25	3.88
111B	3.76	1.71	2.42
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	7.50	5.54	4.17
113B	3.63	6.13	7.10
114A	11.08	9.21	7.82
114B	7.66	8.15	9.48
115A	2.34	3.47	4.85
115B	4.53	3.65	5.13
116A	5.21	8.54	8.43
116B	7.89	9.32	10.22
117A	15.13	10.32	8.38
117B	12.14	4.77	9.07
118A	1.70	1.59	1.90
118B	1.66	1.81	1.73
119A	5.27	8.11	10.23
119B	4.37	7.40	6.31
120A	12.20	10.32	11.09
120B	11.10	16.41	13.13
121A	1.15	2.48	4.28

Table 16 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
121B	2.52	3.66	3.21
122A	24.31	24.32	20.19
122B	21.13	26.27	28.48
123A	22.32	26.28	21.40
123B	25.38	26.16	25.35
124A	20.39	21.11	23.28
124B	25.12	25.41	21.33
125A	27.28	20.13	22.86
125B	28.17	23.42	29.88
126A	21.62	25.72	22.41
126B	23.17	21.20	23.82
127A	22.46	15.44	21.16
127B	19.17	20.29	23.71
128A	20.42	22.84	24.76
128B	16.49	17.37	20.12
129A	18.31	20.23	19.71
129B	19.45	15.46	15.30
130A	12.48	10.66	9.83
130B	11.73	9.15	8.24
131A	Sample not tested - high resistance		
131B	" " " " "		

Table 16 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
132A	10.11	14.25	15.48
132B	12.24	17.71	13.63
133A	11.37	14.62	11.28
133B	15.17	13.77	14.54
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested - high resistance after sterilization		
135B	" " " " " " "		
136A	17.09	18.00	15.17
136B	14.23	12.32	16.88
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	23.47	20.35	24.66
138B	25.21	22.37	20.42
139A	23.46	20.35	21.07
139B	12.27	15.42	20.33
140A	12.42	12.37	12.59
140B	8.01	16.53	15.65
141A	10.72	8.22	10.31
141B	6.74	9.45	7.51
142A	5.05	6.57	7.23
142B	8.62	7.13	7.30

Table 16 (Continued)

Weight Loss of Samples due to Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No. 1 Weight Loss (%)	Ster. No. 2 Weight Loss (%)	Ster. No. 3 Weight Loss (%)
143A	2.59	2.41	2.30
143B	2.18	3.74	1.65
144A	10.02	10.09	12.18
144B	9.43	12.46	10.55
145A	3.27	4.28	2.17
145B	2.44	2.18	3.06
146A	2.07	3.73	3.10
146B	3.12	2.12	2.16
147A	2.19	1.32	1.41
147B	2.73	1.74	2.95
148A	6.15	5.20	7.13
148B	4.33	4.59	6.24
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 17

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%0)	ΔL (%)	Thickness Dry	Thickness Wet
101A	1	1 1/8	4 1/2	1 1/4	5 5/16	11.2	18.0	0.0024	0.0019
101B		1 3/16	4 1/2	1 5/16	5 1/4	10.6	16.6	0.0024	0.0019
101A	2	1 3/16	4 7/16	1 5/16	5 1/2	10.6	24.0	0.0022	0.0018
101B		1 3/16	4 9/16	1 3/8	5 5/16	15.8	16.5	0.0023	0.0019
101A	3	1 3/16	4 1/2	1 3/8	5 3/8	15.8	19.4	0.0023	0.0018
101B		1 3/16	4 9/16	1 3/8	5 1/4	15.8	15.0	0.0023	0.0018
102A	1	1 3/16	5 3/8	1 1/2	5 7/8	26.3	9.3	0.0019	0.0018
102B		1 1/4	5 1/4	1 1/2	5 3/4	20.0	9.5	0.0018	0.0018
102A	2	1 1/4	5 7/16	1 9/16	5 15/16	25.0	9.2	0.0019	0.0018
102B		1 1/4	5 7/16	1 9/16	5 7/8	25.0	8.0	0.0019	0.0019
102A	3	1 3/16	5 7/16	1 1/2	5 15/16	26.3	9.2	0.0020	0.0018
102B		1 3/16	5 3/8	1 7/16	5 5/8	26.3	8.7	0.0012	0.0018

All dimensions are in inches

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
103A	1	1 7/16	5 3/4	1 1/2	6 1/8	4.4	6.5	0.0017	0.0015
103B		1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0017	0.0016
103A	2	1 7/16	5 13/16	1 1/2	6 1/8	4.4	5.4	0.0017	0.0015
103B		1 7/16	5 13/16	1 9/16	6 1/16	8.7	4.3	0.0017	0.0016
103A	3	1 3/8	5 3/4	1 1/2	6 1/8	9.2	6.5	0.0018	0.0015
103B		1 7/16	5 3/4	1 1/2	6 1/8	4.4	6.5	0.0017	0.0016
104A	1	1 3/8	5 7/8	1 7/16	6 1/4	4.6	6.4	0.0020	0.0015
104B		1 3/8	5 15/16	1 7/16	6 1/4	4.6	5.3	0.0020	0.0016
104A	2	1 3/8	5 15/16	1 7/16	6 5/16	4.6	6.3	0.0020	0.0014
104B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0019	0.0014
104A	3	1 3/8	5 13/16	1 7/16	6 3/16	4.6	6.5	0.0020	0.0014
104B		1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.2	0.0020	0.0014

All dimensions are in inches

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
105A	1	1 1/2	5 3/4	1 9/16	6 1/4	4.2	8.7	0.0022	0.0024
105B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0027	0.0022
105A	2	1 1/2	5 13/16	1 9/16	6 3/16	4.2	6.5	0.0025	0.0024
105B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0026	0.0023
105A	3	1 1/2	5 3/4	1 9/16	6 1/4	4.2	8.7	0.0032	0.0024
105B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0028	0.0024
106A	1	1 7/16	5 7/16	1 9/16	6 1/16	8.7	11.5	0.0020	0.0015
106B		1 1/2	6	1 9/16	6 3/8	4.2	6.2	0.0019	0.0015
106A	2	1 7/16	5 7/16	1 1/2	6 1/16	4.4	11.5	0.0020	0.0014
106B		1 3/8	5 5/8	1 1/2	6 3/16	8.4	7.8	0.0020	0.0015
106A	3	1 7/16	5 1/2	1 1/2	6 3/16	4.4	12.5	0.0021	0.0014
106B		1 1/2	5 13/16	1 9/16	6 3/8	4.2	9.7	0.0020	0.0014

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
107A	1	1 1/2	5 5/8	1 9/16	6 3/16	4.2	9.0	0.0023	0.0018
107B		1 1/2	5 13/16	1 9/16	6 1/4	4.2	7.5	0.0020	0.0017
107A	2	1 7/16	5 11/16	1 1/2	6 1/4	4.4	9.9	0.0022	0.0018
107B		1 1/2	5 3/4	1 9/16	6 3/16	4.2	7.6	0.0021	0.0016
107A	3	1 1/2	5 9/16	1 9/16	6 1/8	4.2	10.1	0.0021	0.0018
107B		1 7/16	5 3/4	1 1/2	6 1/4	4.4	7.7	0.0021	0.0018
108A	1	1 7/16	5 3/4	1 9/16	6 1/8	8.8	6.5	0.0011	0.0013
108B		1 7/16	5 13/16	1 9/16	6 1/8	8.8	5.4	0.0010	0.0013
108A	2	1 7/16	5 7/8	1 9/16	6 3/16	8.8	8.5	0.0011	0.0013
108B		1 3/8	5 3/4	1 1/2	6 1/8	9.1	6.5	0.0011	0.0013
108A	3	1 7/16	5 11/16	1 1/2	6 3/16	4.4	8.8	0.0010	0.0013
108B		1 1/2	5 7/8	1 9/16	6 5/16	4.2	7.5	0.0011	0.0013

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
109A	1	1 1/2	5 7/16	1 5/8	6 1/8	8.4	12.6	0.0018	0.0017
109B		1 1/2	5 5/8	1 9/16	6 1/8	4.2	8.9	0.0017	0.0018
109A	2	1 7/16	5 9/16	1 9/16	6 3/16	8.8	11.2	0.0017	0.0017
109B		1 7/16	5 5/8	1 9/16	6 1/8	8.8	8.9	0.0017	0.0017
109A	3	1 7/16	5 3/4	1 9/16	6 3/16	8.8	7.6	0.0017	0.0017
109B		1 1/2	5 7/8	1 5/8	6 7/16	8.4	9.5	0.0016	0.0017
110A	1	1 1/2	5 13/16	1 9/16	6	4.2	3.2	0.0020	0.0017
110B		1 7/16	5 13/16	1 1/2	6	4.4	3.2	0.0022	0.0014
110A	2	1 7/16	5 13/16	1 1/2	6 1/6	4.4	4.3	0.0020	0.0016
110B		1 7/16	5 7/8	1 1/2	6 1/16	4.4	3.2	0.0020	0.0016
110A	3	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0021	0.0017
110B		1 7/16	5 13/16	1 1/2	6 1/16	4.4	4.3	0.0020	0.0015

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
111A	1	1 7/16	5 7/8	1 5/8	6 13/16	13.0	15.9	0.0020	0.0018
111B		1 7/16	5 7/8	1 9/16	6 1/2	8.7	10.6	0.0020	0.0017
111A	2	1 7/16	6	1 5/8	6 3/4	13.0	12.5	0.0019	0.0018
111B		1 7/16	5 15/16	1 5/8	6 13/16	13.0	4.2	0.0019	0.0018
111A	3	1 3/8	5 7/8	1 5/8	6 7/16	17.4	9.6	0.0020	0.0019
111B		1 7/16	5 15/16	1 5/8	6 3/4	13.0	13.7	0.0020	0.0019
112A	1								
112B									
112A	2	Sample not tested - high resistance							
112B									
112A	3								
112B									

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
113A	1	1 7/16	5 9/16	1 1/2	6 1/16	4.4	9.0	0.0030	0.0024
113B		1 7/16	5 5/8	1 1/2	6	4.4	6.6	0.0030	0.0021
113A	2	1 1/2	5 11/16	1 9/16	5 15/16	4.2	4.4	0.0032	0.0023
113B		1 1/2	5 11/16	1 9/16	6 1/16	4.2	6.6	0.0029	0.0023
113A	3	1 3/8	5 5/8	1 1/2	6 3/16	9.2	10.0	0.0030	0.0021
113B		1 7/16	5 5/8	1 1/2	6 1/16	4.4	7.8	0.0034	0.0021
114A	1	1 3/8	5 1/8	1 7/16	5 1/2	4.6	7.3	0.0010	0.0012
114B		1 7/16	5 1/4	1 1/2	5 9/16	4.4	6.0	0.0010	0.0011
114A	2	1 3/8	5 5/16	1 1/2	5 5/8	9.2	5.9	0.0010	0.0015
114B		1 3/8	5 5/16	1 7/16	5 5/8	4.6	8.4	0.0011	0.0014
114A	3	1 3/8	5 7/16	1 7/16	5 5/8	4.6	3.5	0.0011	0.0015
114B		1 7/16	5 5/8	1 1/2	5 15/16	4.4	5.6	0.0010	0.0013

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW(%)	ΔL (%)	Thickness Dry	Thickness Wet
115A	1	1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0017	0.0019
115B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0017	0.0018
115A	2	1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0017	0.0019
115B		1 7/16	5 7/8	1 1/2	6 1/16	4.4	3.2	0.0017	0.0019
115A	3	1 1/2	6	1 9/16	6 3/16	4.2	3.1	0.0018	0.0019
115B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0017	0.0019
116A	1	1 1/2	5 15/16	1 1/2	6 3/16	0.0	4.2	0.0020	0.0022
116B		1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.3	0.0020	0.0023
116A	2	1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.2	0.0018	0.0021
116B		1 1/2	6	1 1/2	6 3/16	0.0	3.2	0.0019	0.0022
116A	3	1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0020	0.0021
116B		1 7/16	5 15/16	1 1/2	6 1/8	4.4	3.2	0.0020	0.0022

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW(%)	ΔL (%)	Thickness Dry	Thickness Wet
117A	1	1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.1	0.0013	0.0016
117B		1 1/2	6	1 1/2	6 1/8	0.0	2.2	0.0013	0.0015
117A	2	1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0010	0.0014
117B		1 7/16	6	1 1/2	6 1/8	4.4	2.2	0.0011	0.1114
117A	3	1 1/2	6 1/16	1 1/2	6 3/16	0.0	2.1	0.009	0.0013
117B		1 1/2	6	1 9/16	6 3/16	4.2	3.1	0.0011	0.0014
118A	1	1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0016	0.0018
118B		1 1/2	6	1 9/16	6 3/16	4.2	3.1	0.0015	0.0017
118A	2	1 7/16	5 15/16	1 1/2	6 1/8	4.4	3.1	0.0017	0.0019
118B		1 7/16	6	1 1/2	6 1/8	4.4	2.2	0.0016	0.0019
118A	3	1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0017	0.0020
118B		1 1/2	6 1/16	1 1/2	6 3/16	0.0	2.1	0.0015	0.0019

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
119A	1	1 7/16	5 3/4	1 9/16	6 11/16	8.8	16.3	0.0024	0.0022
119B		1 1/2	5 13/16	1 5/8	6 3/16	8.4	6.5	0.0022	0.0021
119A	2	1 7/16	5 13/16	1 9/16	6 3/16	8.8	6.5	0.0025	0.0021
119B		1 7/16	5 3/4	1 9/16	6 1/8	8.8	6.6	0.0022	0.0020
119A	3	1 7/16	5 5/8	1 1/2	6	4.4	6.7	0.0023	0.0022
119B		1 7/16	5 3/4	1 9/16	6 1/8	8.8	6.6	0.0024	0.0022
120A	1	1 1/2	6	1 1/2	5 13/16	0.0	-3.1	0.0009	0.0014
120B		1 1/2	6	1 1/2	6 1/16	0.0	1.0	0.0010	0.0013
120A	2	1 1/2	5 7/8	1 9/16	5 13/16	4.2	-1.1	0.0010	0.0013
120B		1 1/2	6	1 9/16	6	4.2	0.0	0.0011	0.0014
120A	3	1 1/2	5 7/8	1 9/16	5 7/8	4.2	0.0	0.0008	0.0010
120B		1 1/2	6	1 9/16	6	4.2	0.0	0.0009	0.0010

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
121A	1	1 7/16	5 15/16	1 1/2	6 5/16	4.4	6.3	0.0018	0.0016
121B		1 1/2	6	1 9/16	6 1/4	4.2	3.1	0.0017	0.0018
121A	2	1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0018	0.0019
121B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	4.2	0.0016	0.0018
121A	3	1 7/16	5 7/8	1 1/2	6 1/16	4.4	3.2	0.0018	0.0019
121B		1 1/2	5 7/8	1 9/16	6 1/16	4.2	3.2	0.0017	0.0018
122A	1	1 1/8	4 15/16	1 1/4	5 9/16	11.2	12.7	0.0019	0.0021
122B		1 1/8	5	1 1/4	5 7/16	11.2	8.8	0.0020	0.0022
122A	2	1 1/8	5 1/16	1 1/4	5 3/4	11.2	13.6	0.0020	0.0021
122B		1 3/16	5 1/8	1 5/16	5 7/8	10.5	14.6	0.0019	0.0021
122A	3	1 1/8	4 5/8	1 3/16	5 1/16	5.6	9.4	0.0018	0.0021
122B		1 1/8	4 7/8	1 1/4	5 1/8	11.2	5.2	0.0020	0.0022

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
123A	1	1 1/2	5	1 1/2	5 1/8	0.0	2.5	0.0012	0.0016
123B		1 1/2	5 1/8	1 1/2	5 7/16	0.0	6.1	0.0012	0.0016
123A	2	1 3/8	5	1 1/2	5 1/4	9.2	5.0	0.0013	0.0016
123B		1 7/16	5 1/4	1 1/2	5 1/2	4.4	4.6	0.0013	0.0015
123A	3	1 3/8	4 15/16	1 1/2	5 1/8	9.2	6.5	0.0013	0.0014
123B		1 3/8	4 7/8	1 1/2	5	9.2	2.6	0.0013	0.0015
124A	1	1 1/2	5 15/16	1 5/8	6 1/4	8.4	5.3	0.0016	0.0017
124B		1 1/2	5 15/16	1 5/8	6 1/4	8.4	5.3	0.0016	0.0017
124A	2	1 7/16	5 7/8	1 9/16	6 1/4	8.8	6.4	0.0016	0.0017
124B		1 7/16	5 15/16	1 1/2	6 5/16	4.4	6.3	0.0015	0.0016
124A	3	1 7/16	5 15/16	1 9/16	6 5/16	8.8	6.3	0.0016	0.0017
124B		1 7/16	5 7/8	1 9/16	6 1/4	8.8	5.3	0.0016	0.0018

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
125A	1	1 3/8	4 3/4	1 1/2	5 1/8	9.2	7.9	o.0015	0.0018
125B		1 7/16	5	1 1/2	5 1/2	4.4	10.0	0.0018	0.0019
125A	2	1 5/16	4 7/8	1 7/16	5 1/4	9.6	7.7	0.0018	0.0018
125B		1 7/16	5 1/16	1 9/16	5 1/2	8.7	8.7	0.0016	0.0018
125A	3	1 1/4	4 15/16	1 3/8	5 7/16	10.1	7.6	0.0017	0.0018
125B		1 5/16	4 7/8	1 7/16	5 7/16	9.5	12.7	0.0017	0.0020
126A	1	1 5/16	4 13/16	1 7/16	5 3/8	9.5	11.7	0.0009	0.0018
126B		1 1/4	4 3/4	1 3/8	5 1/4	10.0	10.5	0.0009	0.0015
126A	2	1 5/16	4 7/8	1 7/16	5 3/8	9.5	10.2	0.0007	0.0018
126B		1 5/16	4 7/8	1 1/2	5 3/16	14.3	6.5	0.0008	0.0017
126A 126B	3	Sample degraded - not tested							
127A	1	1 5/16	5 5/16	1 7/16	5 1/2	9.6	3.5	0.0016	0.0020
127B		1 5/16	5 3/8	1 7/16	5 1/2	9.6	2.3	0.0016	0.0019
127A	2	1 5/16	5 7/16	1 7/16	5 3/4	9.6	5.7	0.0016	0.0020
127B		1 3/8	5	1 1/2	5 3/16	9.1	3.8	0.0016	0.0020
127A	3	1 5/16	5 1/2	1 7/16	5 3/4	9.6	4.5	0.0018	0.0020
127B		1 3/8	5	1 1/2	5 3/16	9.1	3.8	0.0018	0.0019

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
128A	1	1 7/16	5 3/4	1 1/2	6	4.4	4.2	0.0017	0.0016
128B		1 7/16	5 13/16	1 1/2	6 1/8	4.4	5.4	0.0016	0.0017
128A	2	1 1/2	5 13/16	1 9/16	6 1/8	4.2	5.4	0.0015	0.0015
128B		1 1/2	5 3/4	1 9/16	6	4.2	4.2	0.0016	0.0016
128A	3	1 1/2	5 15/16	1 5/8	6 3/16	8.4	4.2	0.0018	0.0016
128B		1 1/2	5 7/8	1 9/16	6 3/16	4.2	4.2	0.0017	0.0016
129A	1	1 1/2	5 13/16	1 9/16	6 3/16	4.2	6.5	0.0010	0.0013
129B		1 1/2	5 3/4	1 9/16	6 1/16	4.4	5.5	0.0011	0.0013
129A	2	1 7/16	5 3/4	1 9/16	6 1/8	8.8	6.5	0.0010	0.0013
129B		1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0010	0.0013
129A	3	1 3/8	5 13/16	1 7/16	6 3/16	4.6	6.5	0.0010	0.0013
129B		1 7/16	5 13/16	1 1/2	6 3/16	4.4	6.5	0.0010	0.0013

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
130A	1	1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0017	0.0018
130B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0017	0.0019
130A	2	1 7/16	5 15/16	1 1/2	6 1/8	4.4	3.1	0.0018	0.0018
130B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0018	0.0017
130A	3	1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0017	0.0019
130B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0017	0.0017
131A	1								
131B									
131A	2	Sample not tested - high resistance							
131B									
131A	3								
131B									
132A	1	1 1/2	5 5/8	1 9/16	6	4.2	6.7	0.0029	0.0026
132B		1 1/2	5 3/4	1 9/16	6 3/16	4.2	7.6	0.0030	0.0026
132A	2	1 7/16	5 11/16	1 1/2	6	4.4	5.5	0.0028	0.0025
132B		1 7/16	5 13/16	1 1/2	6 1/8	4.4	5.4	0.0029	0.0026
132A	3	1 1/2	5 5/8	1 9/16	5 7/8	4.2	4.4	0.0030	0.0026
132B		1 7/16	5 3/4	1 1/2	6 1/16	4.4	5.4	0.0030	0.0025

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
133A	1	1 7/16	5 1/2	1 9/16	5 7/8	8.8	6.8	0.0021	0.0022
133B		1 1/2	5 9/16	1 9/16	5 15/16	4.2	6.8	0.0021	0.0022
133A	2	1 3/8	5 3/8	1 1/2	5 15/16	9.2	10.5	0.0025	0.0024
133B		1 7/16	5 1/2	1 9/16	5 7/8	8.8	6.8	0.0023	0.0024
133A	3	1 7/16	5 7/16	1 1/2	5 13/16	4.4	6.9	0.0027	0.0024
133B		1 1/2	5 5/8	1 9/16	5 13/16	4.2	3.3	0.0028	0.0025
134A	1								
134B									
134A	2	Sample not tested - high resistance							
134B									
134A	3								
134B									
135A	1								
135B									
135A	2	Sample not tested - high resistance after sterilization							
135B									
135A	3								
135B									
136A	1	1 7/16	5 5/16	1 1/2	5 11/16	4.4	7.1	0.0020	0.0018
136B		1 7/16	5 3/8	1 1/2	5 11/16	4.4	5.8	0.0018	0.0017
136A	2	1 1/2	5 3/8	1 9/16	5 5/8	4.2	4.7	0.0021	0.0018
136B		1 1/2	5 1/2	1 9/16	5 5/8	4.2	2.3	0.0021	0.0018
136A	3	1 1/2	5 1/2	1 9/16	5 3/4	4.2	4.5	0.0020	0.0017
136B		1 1/2	5 9/16	1 9/16	5 7/8	4.2	5.6	0.0020	0.0018

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
137A	1								
137B									
137A	2	Sample not tested - high resistance							
137B									
137A	3								
137B									
138A	1	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0019	0.0021
138B		1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0020	0.0021
138A	2	1 3/8	5 7/8	1 7/16	6 1/8	4.6	4.3	0.0020	0.0022
138B		1 7/16	5 7/8	1 9/16	6 3/16	8.7	4.3	0.0021	0.0022
138A	3	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0019	0.0022
138B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0019	0.0022
139A	1	1 7/16	5 5/16	1 1/2	5 3/4	4.4	8.2	0.0020	0.0021
139B		1 1/2	5 1/4	1 9/16	5 13/16	4.2	9.4	0.0020	0.0021
139A	2	1 3/8	5 5/16	1 7/16	5 13/16	4.6	9.4	0.0019	0.0022
139B		1 3/8	5 1/2	1 1/2	5 15/16	9.1	8.0	0.0020	0.0022
139A	3	1 3/8	5 5/16	1 7/16	5 3/4	4.6	8.2	0.0020	0.0022
139B		1 7/16	5 3/8	1 1/2	5 7/8	4.4	9.3	0.0020	0.0021

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
140A	1	1 3/8	5 15/16	1 7/16	6 3/16	4.6	4.2	0.0034	0.0025
140B		1 3/8	6	1 7/16	6 1/4	4.6	4.2	0.0032	0.0027
140A	2	1 1/2	5 11/16	1 5/8	5 15/16	8.3	4.4	0.0030	0.0025
140B		1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0029	0.0025
140A	3	1 7/16	5 3/4	1 9/16	6 5/16	8.8	9.8	0.0034	0.0025
140B		1 3/8	5 3/4	1 7/16	6 5/16	4.6	9.8	0.0034	0.0026
141A	1	1 1/2	4 3/4	1 5/8	5 3/16	8.4	9.2	0.0029	0.0022
141B		1 1/2	4 3/4	1 5/8	5 1/4	8.4	3.7	0.0027	0.0022
141A	2	1 1/2	4 3/16	1 9/16	4 3/8	4.2	4.5	0.0026	0.0022
141B		1 1/2	4 1/4	1 9/16	4 5/8	4.2	2.9	0.0022	0.0022
141A	3	1 1/2	5 1/2	1 9/16	5 11/16	4.2	3.4	0.0025	0.0025
141B		1 1/2	5 3/8	1 9/16	5 5/8	4.2	4.7	0.0026	0.0025

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
142A	1	1 1/2	4 7/8	1 5/8	5 3/16	8.4	6.4	0.0026	0.0023
142B		1 1/2	5	1 5/8	5 3/16	8.4	3.7	0.0026	0.0023
142A	2	1 7/16	5	1 1/2	5 3/16	4.4	3.7	0.0028	0.0024
142B		1 7/16	5 1/16	1 1/2	5 3/8	4.4	6.2	0.0028	0.0028
142A	3	1 1/2	4 13/16	1 9/16	5 1/4	4.2	5.4	0.0028	0.0024
142B		1 1/2	4 13/16	1 5/8	5 3/16	8.4	7.8	0.0028	0.0024
143A	1	1 1/2	5 7/8	1 5/8	6 1/8	8.3	4.3	0.0020	0.0024
143B		1 1/2	5 7/8	1 5/8	6 1/8	8.3	4.3	0.0021	0.0025
143A	2	1 1/2	5 13/16	1 9/16	6 1/16	4.2	4.3	0.0021	0.0026
143B		1 1/2	5 7/8	1 5/8	6 1/16	8.3	3.2	0.0020	0.0024
143A	3	1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.3	0.0019	0.0025
143B		1 1/2	5 13/16	1 9/16	6	4.2	3.2	0.0019	0.0023

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
144A	1	1 1/4	5 1/4	1 3/8	5 9/16	10.1	5.9	0.0022	0.0024
144B		1 1/4	5 1/4	1 3/8	5 9/16	10.1	5.9	0.0022	0.0023
144A	2	1 1/4	5 1/4	1 3/8	5 5/8	10.1	7.1	0.0025	0.0024
144B		1 1/4	5 3/16	1 3/8	5 1/2	10.1	5.7	0.0021	0.0021
144A	3	1 1/4	5 3/16	1 3/8	5 11/16	10.1	9.6	0.0032	0.0024
144B		1 1/4	5 1/4	1 3/8	5 9/16	10.1	5.9	0.0027	0.0022
145A	1	1 7/16	5 7/8	1 1/2	6 5/16	4.3	7.4	0.0018	0.0016
145B		1 1/2	5 7/8	1 9/16	6 5/16	4.2	7.4	0.0018	0.0016
145A	2	1 7/16	5 7/8	1 1/2	6 3/8	4.3	8.5	0.0019	0.0017
145B		1 7/16	5 15/16	1 1/2	6 5/16	4.3	6.3	0.0019	0.0017
145A	3	1 1/2	5 7/8	1 9/16	6 5/16	4.2	7.4	0.0018	0.0016
145B		1 1/2	5 13/16	1 9/16	6 1/4	4.2	7.5	0.0019	0.0017

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Samples No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
146A	1	1 1/2	5 3/4	1 5/8	6 1/16	8.3	5.4	0.0016	0.0014
146B		1 1/2	5 13/16	1 5/8	6 1/8	8.3	5.4	0.0017	0.0015
146A	2	1 7/16	5 13/16	1 9/16	6 3/16	8.7	6.5	0.0015	0.0013
146B		1 7/16	5 7/8	1 9/16	6 3/16	8.7	5.3	0.0015	0.0013
146A	3	1 1/2	5 13/16	1 5/8	6 1/4	8.3	7.5	0.0015	0.0013
146B		1 1/2	5 3/4	1 5/8	6 1/8	8.3	6.5	0.0017	0.0015
147A	1	1 7/16	5 7/8	1 5/8	6 1/4	13.0	6.4	0.0021	0.0016
147B		1 7/16	5 7/8	1 9/16	6 5/16	8.7	7.4	0.0021	0.0016
147A	2	1 1/2	5 13/16	1 5/8	6 3/16	8.3	6.5	0.0020	0.0016
147B		1 7/16	5 7/8	1 9/16	6 5/16	8.7	7.4	0.0022	0.0017
147A	3	1 1/2	5 15/16	1 9/16	6 5/16	8.7	6.3	0.0022	0.0017
147B		1 1/2	5 15/16	1 5/8	6 1/4	8.3	5.3	0.0018	0.0016

Table 17 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
148A	1	1 1/2	5 7/8	1 5/8	6 5/16	8.3	7.4	0.0016	0.0015
148B		1 1/2	6	1 5/8	6 9/16	8.3	9.4	0.0016	0.0015
148A	2	1 1/2	6	1 5/8	6 9/16	8.3	9.4	0.0016	0.0016
148B		1 7/16	5 15/16	1 5/8	6 1/2	13.0	9.5	0.0016	0.0015
148A	3	1 7/16	5 13/16	1 5/8	6 3/8	13.0	9.7	0.0016	0.0015
148B		1 1/2	5 7/8	1 5/8	6 5/16	8.3	7.4	0.0016	0.0016
149A	1								
149B									
149A	2	Sample not tested - degraded during grafting							
149B									
149A	3								
149B									
150A	1								
150B									
150A	2	Sample not tested - degraded during grafting							
150B									
150A	3								
150B									
151A	1								
151B									
151A	2	Sample not tested - degraded during grafting							
151B									
151A	3								
151B									

Table 18

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
101A	1	1 3/16	4 9/16	1 5/16	5 7/16	10.8	19.2	0.0022	0.0018
101B		1 1/8	4 1/2	1 1/4	5 3/8	11.4	20.1	0.0023	0.0019
101A	2	1 1/8	4 1/2	1 1/4	5 5/16	10.5	18.0	0.0022	0.0018
101B		1 3/16	4 1/2	1 5/16	5 7/16	10.7	21.1	0.0021	0.0018
101A	3	1 3/16	4 7/16	1 5/16	5 5/16	10.6	19.6	0.0023	0.0018
101B		1 1/4	4 9/16	1 3/8	5 3/8	10.9	18.4	0.0023	0.0019
102A	1	1 1/4	5 9/16	1 9/16	6 1/8	25.0	10.1	0.0019	0.0018
102B		1 1/8	5 9/16	1 3/8	6 1/16	22.2	10.1	0.0019	0.0018
102A	2	1 3/16	5 3/8	1 1/2	5 7/8	26.3	9.3	0.0020	0.0018
102B		1 3/16	5 3/8	1 1/2	5 15/16	26.3	10.1	0.0019	0.0017
102A	3	1 1/4	5 9/16	1 5/8	6	30.0	10.4	0.0020	0.0018
102B		1 3/16	5 7/16	1 9/16	5 15/16	31.5	9.2	0.0019	0.0017

All dimensions are in inches

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
103A	1	1 1/2	5 3/4	1 5/8	6 1/16	8.5	5.4	0.0018	0.0015
103B		1 7/16	5 13/16	1 1/2	6 1/8	4.3	5.4	0.0017	0.0014
103A	2	1 7/16	5 11/16	1 1/2	6 1/16	4.3	6.7	0.0018	0.0015
103B		1 1/2	5 3/4	1 9/16	6 1/8	4.1	6.5	0.0017	0.0015
103A	3	1 3/8	5 3/4	1 7/16	6 1/8	4.5	6.5	0.0017	0.0015
103B		1 7/16	5 13/16	1 1/2	6 1/8	4.3	5.4	0.0017	0.0014
104A	1	1 7/16	5 7/8	1 1/2	6 1/4	8.6	6.3	0.0020	0.0015
104B		1 3/8	5 7/8	1 7/16	6 3/16	4.5	5.3	0.0020	0.0014
104A	2	1 3/8	5 15/16	1 7/16	6 5/16	4.5	6.3	0.0019	0.0014
104B		1 5/16	5 13/16	1 6/16	6 3/16	4.7	6.4	0.0020	0.0015
104A	3	1 3/8	5 7/8	1 7/16	6 1/4	4.5	6.3	0.0020	0.0014
104B		1 3/8	5 15/16	1 7/16	6 1/4	4.5	5.2	0.0021	0.0015

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
105A	1	1 1/2	5 3/4	1 9/16	6 1/4	4.1	8.6	0.0022	0.0024
105B		1 3/8	5 3/4	1 7/16	6 3/16	4.5	7.6	0.0026	0.0024
105A	2	1 1/2	5 13/16	1 9/16	6 1/4	4.1	7.5	0.0025	0.0023
105B		1 1/2	5 3/4	1 9/16	6 5/16	4.1	9.7	0.0030	0.0024
105A	3	1 3/8	5 13/16	1 7/16	6 1/4	4.5	7.5	0.0027	0.0024
105B		1 1/2	5 3/4	1 9/16	6 5/16	4.1	9.7	0.0025	0.0024
106A	1	1 7/16	5 7/16	1 9/16	6 1/16	8.6	11.4	0.0020	0.0015
106B		1 1/2	5 1/2	1 1/2	6 1/8	0.0	11.3	0.0020	0.0014
106A	2	1 7/16	5 7/16	1 9/16	6 1/16	8.6	11.4	0.0021	0.0015
106B		1 1/2	5 7/16	1 9/16	6	4.1	10.3	0.0020	0.0014
106A	3	1 7/16	5 7/16	1 1/2	6 1/16	4.3	11.4	0.0021	0.0014
106B		1 7/16	5 1/2	1 1/2	6 1/8	4.3	11.3	0.0020	0.0014

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
107A	1	1 1/2	5 11/16	1 9/16	6 1/4	4.1	9.9	0.0022	0.0018
107B		1 1/2	5 5/8	1 9/16	6 3/16	4.1	10.0	0.0021	0.0018
107A	2	1 7/16	5 5/8	1 1/2	6 1/4	4.3	11.1	0.0023	0.0018
107B		1 9/16	5 9/16	1 11/16	6 3/16	8.0	11.2	0.0021	0.0018
107A	3	1 1/2	5 5/8	1 9/16	6 3/16	4.1	10.0	0.0022	0.0018
107B		1 1/2	5 11/16	1 9/16	6 1/4	4.1	9.9	0.0022	0.0018
108A	1	1 7/16	5 11/16	1 9/16	6 1/8	8.7	7.7	0.0010	0.0013
108B		1 1/2	5 7/8	1 9/16	6 3/16	4.1	5.3	0.0011	0.0013
108A	2	1 1/2	5 3/4	1 1/2	6 1/4	0.0	8.7	0.0012	0.0013
108B		1 7/16	5 3/4	1 1/2	6 3/16	4.3	7.6	0.0011	0.0013
108A	3	1 7/16	5 13/16	1 9/16	6 1/8	4.3	5.4	0.0011	0.0013
108B		1 1/2	5 3/4	1 1/2	6 3/16	0.0	7.6	0.0010	0.0013

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
109A	1	1 7/16	5 7/16	1 5/8	6 3/16	13.0	13.7	0.0017	0.0017
109B		1 7/16	5 9/16	1 9/16	6 3/16	8.7	11.2	0.0017	0.0017
109A	2	1 1/2	5 1/2	1 5/8	6 1/8	8.3	11.3	0.0017	0.0017
109B		1 3/8	5 5/8	1 9/16	6 3/16	13.6	10.0	0.0018	0.0017
109A	3	1 7/16	5 3/4	1 1/2	6 3/16	4.3	7.6	0.0017	0.0017
109B		1 1/2	5 7/16	1 9/16	6 3/16	4.1	13.7	0.0017	0.0017
110A	1	1 7/16	5 13/16	1 1/2	6 1/16	4.3	4.3	0.0020	0.0015
110B		1 7/16	5 13/16	1 1/2	6	4.3	3.2	0.0020	0.0017
110A	2	1 7/16	5 7/8	1 9/16	6 1/16	8.6	3.2	0.0021	0.0014
110B		1 1/2	5 7/8	1 1/2	6 1/8	0.0	4.3	0.0022	0.0017
110A	3	1 7/16	5 13/16	1 1/2	6	4.3	3.2	0.0020	0.0016
110B		1 7/16	5 15/16	1 1/2	6	4.3	1.1	0.0022	0.0017

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
111A	1	1 7/16	5 7/8	1 5/8	6 3/4	13.0	14.8	0.0020	0.0018
111B		1 3/8	5 13/16	1 9/16	6 7/8	13.6	18.2	0.0020	0.0019
111A	2	1 1/2	5 7/8	1 11/16	6 13/16	12.5	15.9	0.0019	0.0018
111B		1 7/16	5 15/16	1 5/8	6 3/4	13.0	13.6	0.0020	0.0018
111A	3	1 7/16	5 13/16	1 9/16	6 13/16	8.7	17.2	0.0020	0.0018
111B		1 7/16	5 7/8	1 5/8	6 7/8	13.0	17.0	0.0020	0.0018
112A	1								
112B									
112A	2	Samples not tested - high resistance							
112B									
112A	3								
112B									
113A	1	1 7/16	5 11/16	1 9/16	6 3/16	8.7	8.8	0.0030	0.0021
113B		1 3/8	5 9/16	1 7/16	6 1/16	4.5	9.0	0.0031	0.0023
113A	2	1 1/2	5 9/16	1 9/16	6 1/16	4.2	9.0	0.0030	0.0024
113B		1 3/8	5 5/8	1 1/2	6 1/8	9.1	8.9	0.0032	0.0022
113A	3	1 7/16	5 11/16	1 1/2	6 3/16	4.3	8.8	0.0030	0.0021
113B		1 1/2	5 9/16	1 9/16	6 3/16	4.2	11.2	0.0030	0.0021

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
114A	1	1 3/8	5 5/16	1 7/16	5 11/16	4.5	7.1	0.0010	0.0015
114B		1 3/8	5 3/16	1 1/2	5 1/2	9.1	6.0	0.0010	0.0015
114A	2	1 3/8	5 5/16	1 7/16	5 5/8	4.5	5.9	0.0010	0.0015
114B		1 3/8	5 1/8	1 7/16	5 7/16	4.5	6.1	0.0010	0.0015
114A	3	1 7/16	5 3/16	1 1/2	5 1/2	4.3	6.0	0.0010	0.0015
114B		1 3/8	5 5/16	1 7/16	5 5/8	4.5	5.9	0.0010	0.0015
115A	1	1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0017	0.0019
115B		1 1/2	6 1/16	1 5/8	6 3/16	4.3	3.1	0.0017	0.0019
115A	2	1 7/16	6	1 1/2	6 3/16	8.3	3.1	0.0017	0.0019
115B		1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0017	0.0018
115A	3	1 1/2	6 1/16	1 9/16	6 3/16	4.2	2.1	0.0017	0.0019
115B		1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0017	0.0019

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
116A	1	1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0020	0.0022
116B		1 7/16	6	1 9/16	6 1/8	8.7	2.1	0.0019	0.0022
116A	2	1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.1	0.0020	0.0021
116B		1 7/16	6	1 9/16	6 3/16	8.7	3.1	0.0018	0.0022
116A	3	1 7/16	6 1/16	1 1/2	6 3/16	4.3	2.1	0.0020	0.0022
116B		1 1/2	5 15/16	1 1/2	6 3/16	0.0	4.2	0.0020	0.0021
117A	1	1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0013	0.0013
117B		1 7/16	6 1/16	1 1/2	6 3/16	4.3	2.1	0.0013	0.0013
117A	2	1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0013	0.0015
117B		1 7/16	5 15/16	1 1/2	6 1/8	4.3	3.1	0.0010	0.0016
117A	3	1 7/16	5 15/16	1 1/2	6	4.3	1.1	0.0012	0.0014
117B		1 1/2	6 1/16	1 9/16	6 1/8	4.2	2.1	0.0013	0.0016

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
118A	1	1 1/2	6 1/16	1 9/16	6 5/16	4.2	4.1	0.0016	0.0018
118B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0017	0.0019
118A	2	1 7/16	6	1 1/2	6 3/16	4.3	3.1	0.0016	0.0020
118B		1 7/16	6	1 1/2	6 1/8	4.3	2.1	0.0017	0.0018
118A	3	1 1/2	5 15/16	1 9/16	6 1/16	4.2	2.1	0.0016	0.0019
118B		1 1/2	6 1/16	1 9/16	6 1/4	4.2	3.1	0.0016	0.0019
119A	1	1 7/16	5 13/16	1 9/16	6 3/16	8.7	6.5	0.0025	0.0020
119B		1 7/16	5 13/16	1 9/16	6 3/16	8.7	6.5	0.0022	0.0021
119A	2	1 1/2	5 5/8	1 5/8	6 1/16	8.3	7.8	0.0022	0.0020
119B		1 7/16	5 13/16	1 1/2	6 1/8	4.3	5.4	0.0024	0.0020
119A	3	1 7/16	5 13/16	1 9/16	6 3/16	8.7	6.5	0.0024	0.0022
119B		1 7/16	5 3/4	1 1/2	6 1/8	4.3	6.5	0.0022	0.0020

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
120A	1	1 1/2	6	1 1/2	6	0.0	0.0	0.0009	0.0013
120B		1 1/2	6	1 9/16	6	4.2	0.0	0.0008	0.0010
120A	2	1 1/2	5 15/16	1 1/2	6	0.0	1.1	0.0010	0.0014
120B		1 1/2	5 15/16	1 9/16	5 7/8	4.2	-1.1	0.0011	0.0012
120A	3	1 1/2	6	1 9/16	5 15/16	4.2	-1.0	0.0009	0.0013
120B		1 1/2	6	1 1/2	6	0.0	0.0	0.0008	0.0010
121A	1	1 1/2	5 15/16	1 7/16	6 3/16	4.2	4.2	0.0018	0.0016
121B		1 7/16	5 15/16	1 1/2	6 1/8	4.3	3.2	0.0018	0.0016
121A	2	1 7/16	5 7/8	1 1/2	6 1/8	4.3	4.3	0.0017	0.0018
121B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0017	0.0019
121A	3	1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0016	0.0016
121B		1 7/16	5 15/16	1 1/2	6 3/16	4.3	4.2	0.0018	0.0017

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
122A	1	1 1/8	4 15/16	1 1/4	5 1/2	11.1	11.4	0.0020	0.0021
122B		1 1/16	5	1 3/16	5 5/8	11.8	12.5	0.0019	0.0021
122A	2	1 1/8	5 1/16	1 1/4	5 3/4	11.1	13.5	0.0020	0.0022
122B		1 1/8	4 15/16	1 3/16	5 9/16	5.6	12.6	0.0020	0.0022
122A	3	1 3/16	4 15/16	1 3/8	5 5/8	15.8	13.9	0.0020	0.0022
122B		1 1/8	5 1/16	1 1/4	5 11/16	11.1	12.3	0.0018	0.0021
123A	1	1 1/2	5	1 9/16	5 3/16	4.2	3.8	0.0012	0.0016
123B		1 3/8	5 1/16	1 1/2	5 1/4	9.1	3.7	0.0013	0.0014
123A	2	1 7/16	5	1 9/16	5 1/8	4.3	2.5	0.0013	0.0015
123B		1 7/16	4 15/16	1 9/16	5 1/4	8.7	6.3	0.0012	0.0014
123A	3	1 1/2	4 15/16	1 5/8	5 1/16	8.3	2.5	0.0012	0.0016
123B		1 1/2	4 7/8	1 9/16	5 1/8	4.8	5.1	0.0012	0.0016

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
124A	1	1 7/16	5 15/16	1 9/16	6 1/4	8.7	5.3	0.0016	0.0017
124B		1 7/16	5 7/8	1 9/16	6 5/16	8.7	7.4	0.0016	0.0017
124A	2	1 1/2	6	1 9/16	6 7/16	4.3	7.3	0.0016	0.0017
124B		1 7/16	5 15/16	1 5/8	6 7/16	13.0	8.4	0.0016	0.0017
124A	3	1 1/2	6	1 5/8	6 1/2	8.3	8.3	0.0016	0.0017
124B		1 7/16	5 7/8	1 9/16	6 5/16	8.7	7.4	0.0016	0.0017
125A	1	1 5/16	4 7/8	1 7/16	5 1/4	9.5	7.7	0.0015	0.0018
125B		1 1/4	4 15/16	1 5/16	5 3/8	5.0	8.9	0.0015	0.0018
125A	2	1 3/8	4 3/4	1 1/2	5 1/8	9.1	6.6	0.0017	0.0018
125B		1 5/16	4 15/16	1 7/16	5 3/8	9.5	8.9	0.0016	0.0018
125A	3	1 1/4	4 15/16	1 3/8	5 3/8	10.0	8.9	0.0016	0.0018
125B		1 3/8	4 13/16	1 9/16	5 3/16	13.6	7.8	0.0018	0.0018
126A	1								
126B									
126A	2	Samples degraded - not tested							
126B									
126A	3								
126B									

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
127A	1	1 5/16	5 1/2	1 7/16	5 13/16	9.5	5.7	0.0016	0.0020
127B		1 5/16	5 1/2	1 1/2	5 15/16	14.3	8.0	0.0016	0.0020
127A	2	1 5/16	5 3/8	1 7/16	5 11/16	9.5	5.8	0.0016	0.0020
127B		1 5/16	5 7/16	1 7/16	5 3/4	9.5	5.8	0.0016	0.0020
127A	3	1 5/16	5 1/2	1 3/8	5 3/4	4.8	4.5	0.0016	0.0020
127B		1 5/16	5 7/16	1 7/16	5 5/8	9.5	3.4	0.0016	0.0020
128A	1	1 7/16	5 13/16	1 9/16	6 1/16	8.7	4.3	0.0015	0.0016
128B		1 7/16	5 13/16	1 9/16	6 1/16	8.7	4.3	0.0018	0.0016
128A	2	1 7/16	5 3/4	1 5/8	6	13.0	4.3	0.0018	0.0015
128B		1 1/2	5 7/8	1 11/16	6 1/8	12.5	4.3	0.0017	0.0016
128A	3	1 1/2	5 13/16	1 5/8	6 1/8	8.3	5.4	0.0015	0.0015
128B		1 7/16	5 7/8	1 9/16	6 1/8	8.7	4.3	0.0018	0.0015

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
129A	1	1 7/16	5 13/16	1 1/2	6 3/16	4.3	6.5	0.0010	0.0013
129B		1 1/2	5 13/16	1 9/16	6 3/16	4.2	6.5	0.0010	0.0013
129A	2	1 7/16	5 3/4	1 9/16	6 1/8	8.7	6.5	0.0010	0.0013
129B		1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0010	0.0013
129A	3	1 1/2	5 7/8	1 5/8	6 3/16	8.3	5.3	0.0010	0.0013
129B		1 3/8	5 13/16	1 7/16	6 1/8	4.5	5.4	0.0010	0.0013
130A	1	1 7/16	5 7/8	1 1/2	6 3/16	4.3	5.3	0.0017	0.0018
130B		1 7/16	5 15/16	1 1/2	6 5/16	4.3	6.3	0.0017	0.0018
130A	2	1 3/8	5 13/16	1 7/16	6 1/16	4.5	4.3	0.0017	0.0018
130B		1 3/8	5 15/16	1 7/16	6 3/16	4.5	4.2	0.0017	0.0018
130A	3	1 1/2	5 7/8	1 5/8	6 1/4	8.3	5.3	0.0017	0.0018
130B		1 7/16	5 13/16	1 1/2	6 1/8	4.3	5.4	0.0017	0.0018
131A	1								
131B									
131A	2	Samples not tested - high resistance							
131B									
131A	3								
131B									

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
132A	1	1 1/2	5 5/8	1 9/16	5 15/16	4.2	5.6	0.0029	0.0025
132B		1 1/2	5 11/16	1 9/16	6	4.2	5.2	0.0029	0.0026
132A	2	1 9/16	5 3/4	1 5/8	6 1/8	4.0	6.5	0.0030	0.0025
132B		1 7/16	5 3/4	1 1/2	6 1/16	4.3	5.4	0.0030	0.0026
132A	3	1 7/16	5 5/8	1 1/2	6	4.3	6.7	0.0030	0.0025
132B		1 1/2	5 11/16	1 9/16	6	4.2	5.2	0.0030	0.0025
133A	1	1 7/16	5 7/16	1 1/2	5 13/16	4.3	6.9	0.0027	0.0024
133B		1 3/8	5 1/2	1 1/2	5 7/8	9.1	6.8	0.0027	0.0024
133A	2	1 1/2	5 3/8	1 5/8	5 11/16	8.3	5.8	0.0026	0.0024
133B		1 1/2	5 7/16	1 5/8	5 13/16	8.3	6.9	0.0026	0.0024
133A	3	1 3/8	5 7/16	1 7/16	5 13/16	4.5	6.9	0.0025	0.0024
133B		1 3/8	5 1/2	1 7/16	5 7/8	4.5	6.8	0.0025	0.0024
134A	1								
134B									
134A	2	Samples not tested - high resistance							
134B									
134A	3								
134B									
135A	1								
135B									
135A	2	Samples not tested - high resistance after sterilization							
135B									
135A	3								
135B									

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
136A	1	1 7/16	5 5/16	1 1/2	5 5/8	4.3	5.9	0.0020	0.0018
136B		1 1/2	5 5/16	1 9/16	5 9/15	4.2	4.7	0.0020	0.0018
136A	2	1 9/16	5 1/2	1 11/16	5 7/8	8.0	6.8	0.0020	0.0018
136B		1 7/16	5 7/16	1 1/2	5 3/4	4.3	5.7	0.0020	0.0018
136A	3	1 7/16	5 3/8	1 1/2	5 5/8	4.3	4.7	0.0020	0.0018
136B		1 1/2	5 3/8	1 9/16	5 5/8	4.2	4.7	0.0020	0.0018
137A	1								
137B									
137A	2	Samples not tested - high resistance							
137B									
137A	3								
137B									
138A	1	1 7/16	5 7/8	1 1/2	6 1/8	4.3	3.2	0.0019	0.0021
138B		1 7/16	5 13/16	1 1/2	6	4.3	3.2	0.0019	0.0021
138A	2	1 7/16	5 15/16	1 1/2	6 3/16	4.3	4.2	0.0019	0.0021
138B		1 3/8	5 7/8	1 7/16	6 1/16	4.2	3.2	0.0019	0.0021
138A	3	1 7/16	5 7/8	1 1/2	6 1/8	4.3	4.3	0.0019	0.0021
138B		1 7/16	5 15/16	1 1/2	6 1/8	4.3	3.2	0.0019	0.0021

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
139A	1	1 3/8	5 1/4	1 7/16	5 11/16	4.5	8.3	0.0020	0.0022
139B		1 3/8	5 1/4	1 1/2	5 13/16	9.1	7.1	0.0020	0.0022
139A	2	1 7/16	5 5/16	1 1/2	5 13/16	4.3	9.4	0.0020	0.0022
139B		1 5/16	5 5/16	1 3/8	5 3/4	4.8	8.2	0.0020	0.0022
139A	3	1 7/16	5 5/16	1 1/2	5 3/4	4.3	8.2	0.0020	0.0022
139B		1 3/8	5 1/4	1 7/16	5 11/16	4.5	8.3	0.0020	0.0022
140A	1	1 1/2	5 3/4	1 5/8	6	8.3	4.3	0.0034	0.0025
140B		1 1/2	5 3/4	1 9/16	5 15/16	4.2	3.3	0.0033	0.0025
140A	2	1 7/16	5 11/16	1 9/16	5 15/16	8.7	4.4	0.0030	0.0025
140B		1 7/16	5 13/16	1 9/16	6 1/16	8.7	4.3	0.0031	0.0025
140A	3	1 7/16	5 3/4	1 9/16	6	8.7	4.3	0.0030	0.0025
140B		1 3/8	5 11/16	1 1/2	5 15/16	9.1	4.4	0.0034	0.0025

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
141A	1	1 1/2	4 5/16	1 9/16	4 1/2	4.2	4.3	0.0027	0.0022
141B		1 1/2	4 3/8	1 5/8	4 9/16	8.3	4.3	0.0029	0.0022
141A	2	1 1/2	4 3/4	1 5/8	5	8.3	5.3	0.0025	0.0022
141B		1 7/16	4 1/4	1 9/16	4 9/16	8.7	7.4	0.0028	0.0022
141A	3	1 7/16	4 7/8	1 1/2	5 1/16	4.3	3.8	0.0025	0.0022
141B		1 1/2	4 1/2	1 9/16	4 3/4	4.2	5.6	0.0025	0.0022
142A	1	1 1/2	4 15/16	1 5/8	5 3/16	8.3	5.1	0.0028	0.0024
142B		1 7/16	5	1 1/2	5 3/16	4.3	3.8	0.0028	0.0024
142A	2	1 1/2	5 1/16	1 9/16	5 5/16	4.2	4.9	0.0028	0.0024
142B		1 1/2	4 7/8	1 9/16	5 3/16	4.2	6.4	0.0028	0.0024
142A	3	1 7/16	5	1 1/2	5 5/16	4.3	6.3	0.0028	0.0024
142B		1 7/16	4 15/16	1 1/2	5 3/8	4.3	5.1	0.0028	0.0024

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
143A	1	1 1/2	5 7/8	1 9/16	6 1/16	4.2	3.2	0.0021	0.0026
143B		1 1/2	5 13/16	1 5/8	6	8.3	3.2	0.0019	0.0025
143A	2	1 1/2	5 15/16	1 5/8	6 3/16	8.3	4.2	0.0019	0.0023
143B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0020	0.0025
143A	3	1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.3	0.0020	0.0025
143B		1 1/2	5 13/16	1 5/8	6 1/16	8.3	4.3	0.0021	0.0024
144A	1	1 1/4	5 1/4	1 3/8	5 9/16	10.0	5.9	0.0022	0.0024
144B		1 1/4	5 5/16	1 3/8	5 11/16	10.0	7.1	0.0026	0.0023
144A	2	1 1/4	5 3/16	1 3/8	5 9/16	10.0	7.2	0.0023	0.0023
144B		1 3/16	5 1/4	1 5/16	5 5/8	10.5	7.1	0.0027	0.0023
144A	3	1 1/4	5 1/4	1 3/8	5 9/16	10.0	6.0	0.0025	0.0024
144B		1 5/16	5 3/16	1 3/8	5 9/16	4.8	7.2	0.0026	0.0023

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
145A	1	1 7/16	5 13/16	1 1/2	6 1/4	4.3	7.5	0.0018	0.0016
145B		1 1/2	5 15/16	1 9/16	6 3/8	4.2	7.4	0.0019	0.0017
145A	2	1 7/16	5 7/8	1 1/2	6 5/16	4.3	7.4	0.0019	0.0017
145B		1 7/16	5 7/8	1 1/2	6 3/8	4.3	8.5	0.0019	0.0016
145A	3	1 7/16	5 13/16	1 9/16	6 5/16	8.7	8.6	0.0019	0.0016
145B		1 1/2	5 13/16	1 9/16	6 5/16	4.2	8.6	0.0018	0.0016
146A	1	1 9/16	5 3/4	1 11/16	6 1/8	8.3	6.5	0.0015	0.0013
146B		1 1/2	5 3/4	1 5/8	6 1/16	8.3	5.4	0.0015	0.0013
146A	2	1 1/2	5 15/16	1 5/8	6 3/16	8.7	6.5	0.0015	0.0013
146B		1 1/2	5 7/8	1 5/8	6 1/4	8.3	6.4	0.0016	0.0015
146A	3	1 7/16	5 3/4	1 1/2	6 1/16	8.3	5.4	0.0015	0.0013
146B		1 1/2	5 13/16	1 5/8	6 1/8	8.7	5.4	0.0015	0.0013

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
147A	1	1 1/2	5 7/8	1 5/8	6 5/16	8.7	7.4	0.0020	0.0016
147B		1 1/2	5 7/8	1 9/16	6 5/16	8.3	7.4	0.0020	0.0016
147A	2	1 9/16	5 13/16	1 11/16	6 3/16	8.7	6.5	0.0018	0.0016
147B		1 1/2	5 13/16	1 5/8	6 1/4	8.7	7.5	0.0021	0.0017
147A	3	1 1/2	5 3/4	1 9/16	6 1/8	8.3	6.5	0.0018	0.0016
147B		1 1/2	5 7/8	1 9/16	6 5/16	8.3	6.4	0.0021	0.0017
148A	1	1 7/16	6	1 5/8	6 5/8	13.0	10.4	0.0016	0.0015
148B		1 1/2	5 13/16	1 9/16	6 3/8	8.3	9.7	0.0016	0.0015
148A	2	1 9/16	6	1 11/16	6 9/16	8.7	9.4	0.0016	0.0016
148B		1 1/2	5 15/16	1 5/8	6 1/2	8.7	9.5	0.0016	0.0016
148A	3	1 1/2	5 7/8	1 9/16	6 3/8	8.3	8.5	0.0016	0.0015
148B		1 1/2	5 15/16	1 9/16	6 1/2	8.3	9.5	0.0016	0.0016

Table 18 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
149A	1								
149B									
149A	2	Samples not tested - degraded during grafting							
149B									
149A	3								
149B									
150A	1								
150B									
150A	2	Samples not tested - degraded during grafting							
150B									
150A	3								
150B									
151A	1								
151B									
151A	2	Samples not tested - degraded during grafting							
151B									
151A	3								
151B									

Table 19

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
101A	1	1 1/8	4 3/8	1 1/4	5 5/16	11.2	21.4	0.0018	0.0018
101B		1 1/4	4 1/2	1 1/2	5 3/8	16.7	19.4	0.0019	0.0020
101A	2	1 1/8	4 7/16	1 1/4	5 7/16	11.2	22.5	0.0018	0.0018
101B		1 1/8	4 3/8	1 1/4	5 1/4	11.2	20.0	0.0020	0.0021
101A	3	1 1/8	4 5/16	1 5/16	5 1/16	16.6	17.4	0.0022	0.0018
101B		1 3/8	4 1/2	1 5/8	5 1/2	18.2	23.6	0.0020	0.0020
102A	1	1 3/8	5 5/16	1 1/2	5 7/8	9.1	9.6	0.0019	0.0018
102B		1 3/8	5 1/4	1 1/2	6	9.1	14.3	0.0020	0.0019
102A	2	1 3/8	5 5/16	1 9/16	5 15/16	13.6	11.7	0.0019	0.0018
102B		1 3/8	5 5/16	1 9/16	6 1/16	13.6	14.1	0.0018	0.0019
102A	3	1 3/8	5 5/8	1 1/2	5 15/16	9.1	18.1	0.0020	0.0018
102B		1 3/8	5 1/4	1 1/2	6 1/16	9.1	15.5	0.0020	0.0018

All dimensions are in inches

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
103A	1	1 7/16	5 11/16	1 9/16	6	8.8	5.5	0.0014	0.0013
103B		1 1/2	5 3/4	1 5/8	6	8.4	4.3	0.0014	0.0014
103A	2	1 7/16	5 15/16	1 7/16	6 1/16	0.0	2.1	0.0017	0.0013
103B		1 7/16	5 13/16	1 1/2	6	4.2	3.1	0.0017	0.0014
103A	3	1 3/8	5 7/8	1 1/2	6 1/8	9.2	4.3	0.0018	0.0018
103B		1 7/16	5 15/16	1 1/2	6 1/8	4.2	3.2	0.0017	0.0016
104A	1	1 5/16	5 3/8	1 5/16	5 5/8	0.0	4.7	0.0014	0.0017
104B		1 3/8	5 1/2	1 7/16	5 3/4	4.5	4.5	0.0014	0.0017
104A	2	1 3/8	5 7/16	1 7/16	5 7/8	4.6	8.0	0.0014	0.0017
104B		1 1/4	5 11/16	1 5/16	5 15/16	4.2	4.3	0.0014	0.0019
104A	3	1 5/16	5 3/8	1 7/16	5 3/4	9.6	7.0	0.0018	0.0018
104B		1 5/16	5 1/2	1 7/16	5 11/16	9.5	3.5	0.0017	0.0018

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
105A	1	1 5/16	5 3/8	1 3/8	5 5/8	4.8	4.7	0.0011	0.0015
105B		1 1/2	5 1/2	1 9/16	5 11/16	4.2	3.5	0.0010	0.0015
105A	2	1 1/2	5 3/4	1 7/16	6 1/8	4.6	6.5	0.0011	0.0015
105B		1 7/16	5 11/16	1 1/2	5 15/16	4.4	4.3	0.0011	0.0014
105A	3	1 5/16	5 5/8	1 1/2	6 1/16	14.3	7.8	0.0012	0.0013
105B		1 1/4	5 5/8	1 5/16	5 7/8	5.0	2.2	0.0011	0.0015
106A	1	1 3/8	5 13/16	1 1/2	6 1/4	9.1	7.5	0.0014	0.0013
106B		1 3/8	5 15/16	1 7/16	6 3/16	4.5	4.2	0.0013	0.0015
106A	2	1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0014	0.0013
106B		1 1/2	5 11/16	1 9/16	5 15/16	4.2	4.3	0.0014	0.0014
106A	3	1 3/8	5 11/16	1 1/2	6	9.1	5.2	0.0015	0.0017
106B		1 3/8	5 3/4	1 7/16	6 1/16	4.5	4.3	0.0014	0.0015

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
107A	1	1 3/8	5 5/8	1 1/2	6 1/8	9.2	8.9	0.0023	0.0016
107B		1 7/16	5 3/4	1 9/16	6	8.8	4.3	0.0023	0.0017
107A	2	1 7/16	5 1/2	1 5/8	5 3/4	13.0	4.5	0.0024	0.0016
107B		1 7/16	5 1/2	1 9/16	5 11/16	8.8	3.4	0.0023	0.0018
107A	3	1 3/8	5 1/2	1 9/16	6 1/8	13.6	11.3	0.0023	0.0016
107B		1 3/8	5 9/16	1 1/2	5 3/4	9.1	3.4	0.0023	0.0017
108A	1	1 1/2	5 3/4	1 9/16	6 3/16	4.2	7.6	0.0010	0.0010
108B		1 7/16	5 3/4	1 1/2	6 1/16	4.4	4.3	0.0011	0.0011
108A	2	1 7/16	6 1/16	1 9/16	6 5/16	8.8	4.1	0.0010	0.0010
108B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	4.2	0.0011	0.0011
108A	3	1 1/2	5 13/16	1 1/2	6 1/8	0.0	5.4	0.0009	0.0010
108B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	4.2	0.0010	0.0010

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
109A	1	1 7/16	5 13/16	1 1/2	5 15/16	4.4	2.2	0.0016	0.0015
109B		1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.2	0.0015	0.0015
109A	2	1 7/16	5 13/16	1 1/2	6	4.4	3.2	0.0015	0.0015
109B		1 7/16	5 3/4	1 1/2	5 15/16	4.4	3.2	0.0016	0.0016
109A	3	1 7/16	5 15/16	1 1/2	6 1/16	4.4	2.1	0.0018	0.0016
109B		1 7/16	5 7/8	1 1/2	6	4.4	2.1	0.0017	0.0017
110A	1	1 7/16	5 15/16	1 1/2	6 1/8	4.4	3.1	0.0019	0.0015
110B		1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.3	0.0021	0.0015
110A	2	1 7/16	5 15/16	1 1/2	6 1/8	4.4	3.2	0.0022	0.0014
110B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0019	0.0013
110A	3	1 1/2	5 7/8	1 5/8	6 1/8	8.3	4.3	0.0019	0.0014
110B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0021	0.0013

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
111A	1	1 1/2	5 7/8	1 5/8	6 1/2	8.4	10.6	0.0018	0.0017
111B		1 7/16	6	1 9/16	6 1/2	8.4	8.3	0.0016	0.0016
111A	2	Sample tore while being measured						0.0017	0.0018
111B		1 1/2	5 15/16	1 5/8	6 7/16	8.3	8.4	0.0017	0.0016
111A	3	1 1/2	5 7/8	1 5/8	6 1/4	8.3	6.4	0.0017	0.0018
111B		1 7/16	5 15/16	1 9/16	6 7/16	8.5	8.4	0.0017	0.0018
112A	1								
112B									
112A	2	Sample not tested - high resistance							
112B									
112A	3								
112B									
113A	1	1 7/16	5 5/8	1 9/16	6 3/16	8.8	10.0	0.0028	0.0021
113B		1 7/16	5 11/16	1 9/16	6 1/8	8.8	7.7	0.0029	0.0022
113A	2	1 3/8	5 5/8	1 5/8	6 3/16	18.1	10.0	0.0032	0.0021
113B		1 7/16	5 11/16	1 9/16	6 1/8	8.8	7.7	0.0027	0.0021
113A	3	1 7/16	5 9/16	1 1/2	6 1/8	4.4	10.1	0.0024	0.0021
113B		1 7/16	5 5/8	1 5/8	6 1/4	13.0	11.1	0.0024	0.0021

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
114A	1	1 3/8	5 7/8	1 3/8	5 15/16	0.0	1.1	0.0008	0.0011
114B		1 3/8	5 13/16	1 7/16	5 15/16	4.6	2.2	0.0009	0.0013
114A	2	1 3/8	5 15/16	1 1/2	6 1/8	9.2	3.1	0.0009	0.0014
114B		1 3/8	5 3/4	1 1/2	5 15/16	9.1	3.3	0.0010	0.0013
114A	3	1 3/8	5 1/2	1 1/2	5 3/4	9.2	4.5	0.0009	0.0011
114B		1 7/16	5 13/16	1 1/2	6	4.3	3.2	0.0010	0.0012
115A	1	1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0017	0.0019
115B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0017	0.0019
115A	2	1 7/16	5 15/16	1 1/2	6 5/16	4.4	6.3	0.0017	0.0019
115B		1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0016	0.0018
115A	3	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0018	0.0017
115B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0017	0.0017

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
116A	1	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0018	0.0021
116B		1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.1	0.0020	0.0021
116A	2	1 1/2	5 15/16	1 1/2	6 1/8	0.0	3.1	0.0019	0.0020
116B		1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.3	0.0018	0.0020
116A	3	1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0018	0.0020
116B		1 7/16	6	1 1/2	6 3/16	4.4	3.1	0.0020	0.0022
117A	1	1 7/16	6 1/16	1 1/2	6 5/16	4.4	2.1	0.0011	0.0012
117B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0010	0.0013
117A	2	1 1/2	6	1 1/2	6 1/8	0.0	2.1	0.0012	0.0015
117B		1 1/2	6	1 9/16	6 3/16	4.2	2.1	0.0011	0.0014
117A	3	1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0010	0.0012
117B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0012	0.0015

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
118A	1	1 9/16	6	1 5/8	6 1/2	4.0	8.3	0.0020	0.0018
118B		1 1/2	6	1 9/16	6 3/8	4.2	6.3	0.0019	0.0020
118A	2	1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0020	0.0017
118B		1 1/2	6	1 9/16	6 3/8	4.2	4.2	0.0020	0.0019
118A	3	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0021	0.0017
118B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0022	0.0020
119A	1	1 1/2	5 5/8	1 5/8	6 1/8	8.4	8.9	0.0020	0.0019
119B		1 1/2	5 3/4	1 5/8	6 3/16	8.4	7.6	0.0020	0.0021
119A	2	1 7/16	5 1/2	1 1/2	6 7/16	4.4	11.9	0.0021	0.0020
119B		1 7/16	5 5/8	1 1/2	6 1/8	4.4	8.9	0.0020	0.0019
119A	3	1 7/16	5 3/4	1 1/2	6 1/4	4.4	8.7	0.0020	0.0018
119B		1 1/2	5 13/16	1 9/16	6 5/16	4.2	8.6	0.0019	0.0020

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
120A	1	1 1/2	6 1/16	1 9/16	6 1/8	4.2	1.0	0.0009	0.0012
120B		1 7/16	6	1 1/2	6 3/16	4.4	3.1	0.0009	0.0011
120A	2	1 1/2	5 15/16	1 1/2	6	0.0	1.0	0.0009	0.0012
120B		1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0008	0.0012
120A	3	1 1/2	6 1/16	1 9/16	6 5/16	4.2	4.1	0.0010	0.0012
120B		1 1/2	6 1/16	1 9/16	6 1/4	4.2	3.1	0.0010	0.0012
121A	1	1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0015	0.0016
121B		1 1/2	6	1 9/16	6 3/16	4.2	3.1	0.0016	0.0016
121A	2	1 7/16	6	1 1/2	6 1/8	4.4	2.1	0.0015	0.0016
121B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0015	0.0016
121A	3	1 1/2	6	1 9/16	6 1/4	4.2	3.1	0.0016	0.0016
121B		1 7/16	6	1 1/2	6 3/16	4.4	3.1	0.0015	0.0016

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
122A	1	1 1/4	5 1/8	1 3/8	5 11/16	10.1	11.0	0.0019	0.0020
122B		1 5/16	5 1/8	1 3/8	5 5/8	4.8	9.8	0.0019	0.0020
122A	2	1 1/4	5 1/4	1 3/8	5 15/16	10.1	13.1	0.0019	0.0020
122B		1 1/4	5 3/8	1 5/16	5 15/16	5.0	10.5	0.0019	0.0021
122A	3	1 5/16	5 3/8	1 3/8	5 15/16	4.8	10.5	0.0018	0.0020
122B		1 5/16	5 3/8	1 3/8	5 15/16	4.8	10.5	0.0018	0.0020
123A	1	1 1/2	5 3/4	1 9/16	5 7/8	4.2	2.2	0.0013	0.0015
123B		1 1/2	5 13/16	1 9/16	5 7/8	4.2	1.1	0.0013	0.0015
123A	2	1 1/2	5 11/16	1 9/16	5 7/8	4.2	3.3	0.0013	0.0016
123B		1 7/16	5 13/16	1 1/2	5 15/16	4.4	2.2	0.0014	0.0016
123A	3	1 7/16	5 5/8	1 9/16	5 13/16	8.8	3.3	0.0014	0.0015
123B		1 1/2	5 3/4	1 9/16	5 15/16	4.2	3.1	0.0013	0.0015

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Samples No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
124A	1	1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0014	0.0016
124B		1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.2	0.0014	0.0017
124A	2	1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.1	0.0015	0.0017
124B		1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.2	0.0016	0.0019
124A	3	1 7/16	5 7/8	1 1/2	6 1/16	4.4	1.5	0.0016	0.0018
124B		1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.2	0.0014	0.0018
125A	1	1 7/16	4 13/16	1 9/16	5 1/4	8.8	9.1	0.0016	0.0018
125B		1 7/16	5	1 1/2	5 5/8	4.2	12.5	0.0017	0.0019
125A	2	1 7/16	4 15/16	1 9/16	5 3/8	8.8	8.9	0.0017	0.0017
125B		1 1/2	4 7/8	1 9/16	5 1/2	4.2	13.1	0.0018	0.0020
125A	3	1 7/16	4 7/8	1 9/16	5 3/8	8.8	10.3	0.0018	0.0018
125B		1 1/2	5	1 5/8	5 9/16	8.4	11.2	0.0018	0.0019

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
126A	1	1 1/2	6	1 9/16	6 1/2	4.2	8.3	0.0010	0.0015
126B		1 1/2	5 15/16	1 9/16	6 3/8	4.2	7.4	0.0010	0.0015
126A	2	1 5/16	4 3/4	1 7/16	5 1/8	9.5	7.9	0.0011	0.0015
126B		1 1/2	4 7/8	1 9/16	5 1/4	4.2	7.9	0.0011	0.0016
126A	3	1 1/2	6	1 1/2	6 3/8	0.0	6.2	0.0012	0.0016
126B		1 7/16	6	1 1/2	6 9/16	4.4	10.7	0.0010	0.0016
127A	1	1 7/16	5 1/2	1 9/16	5 11/16	8.8	3.4	0.0016	0.0019
127B		1 7/16	5 5/8	1 1/2	5 7/8	4.4	4.5	0.0017	0.0020
127A	2	1 7/16	5 7/16	1 9/16	5 11/16	8.8	4.6	0.0017	0.0020
127B		1 7/16	5 9/16	1 1/2	5 7/8	4.4	5.6	0.0018	0.0019
127A	3	1 1/2	5 1/2	1 5/8	5 11/16	8.4	3.4	0.0016	0.0018
127B		1 7/16	5 5/8	1 1/2	5 7/8	4.4	4.4	0.0017	0.0019

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
128A	1	1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.3	0.0016	0.0016
128B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0015	0.0016
128A	2	1 9/16	5 15/16	1 5/8	6 3/16	4.2	4.2	0.0015	0.0016
128B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0016	0.0016
128A	3	1 1/2	5 13/16	1 5/8	6 1/8	4.0	5.4	0.0016	0.0016
128B		1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0016	0.0016
129A	1	1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0009	0.0012
129B		1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0009	0.0011
129A	2	1 1/2	5 13/16	1 9/16	6 3/16	4.2	6.5	0.0010	0.0012
129B		1 1/2	5 7/8	1 5/8	6 3/16	8.1	5.3	0.0010	0.0012
129A	3	1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0010	0.0013
129B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0010	0.0011

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Samples No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
130A	1	1 7/16	5 13/16	1 1/2	6 1/16	4.4	4.3	0.0017	0.0018
130B		1 1/2	5 13/16	1 9/16	6 1/16	4.2	4.3	0.0017	0.0019
130A	2	1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.1	0.0017	0.0018
130B		1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0017	0.0020
130A	3	1 7/16	5 7/8	1 9/16	6 1/8	8.8	4.3	0.0018	0.0019
130B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0017	0.0019
131A	1								
131B									
131A	2	Samples not tested - high resistance							
131B									
131A	3								
131B									
132A	1	1 7/16	5 5/8	1 1/2	5 15/16	4.4	5.5	0.0024	0.0022
132B		1 7/16	5 3/4	1 1/2	6 1/16	4.4	5.4	0.0023	0.0022
132A	2	1 7/16	5 9/16	1 1/2	5 15/16	4.4	6.7	0.0025	0.0023
132B		1 7/16	5 13/16	1 1/2	6 1/8	4.4	5.3	0.0024	0.0022
132A	3	1 1/2	5 11/16	1 9/16	6	4.2	5.5	0.0027	0.0024
132B		1 1/2	5 3/4	1 9/16	6 1/16	4.4	5.4	0.0026	0.0023

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
133A	1	1 7/16	5 7/16	1 1/2	5 3/4	4.4	5.7	0.0020	0.0019
133B		1 1/2	5 1/2	1 9/16	5 13/16	4.2	5.7	0.0020	0.0021
133A	2	1 1/2	5 7/16	1 9/16	5 3/4	4.2	5.7	0.0022	0.0021
133B		1 1/2	5 7/16	1 5/8	5 3/4	8.8	5.7	0.0022	0.0022
133A	3	1 7/16	5 3/8	1 9/16	5 11/16	8.8	5.8	0.0024	0.0022
133B		1 1/2	5 1/2	1 9/16	5 13/16	4.2	5.7	0.0023	0.0021
134A	1								
134B									
134A	2	Sample not tested - high resistance							
134B									
134A	3								
134B									
135A	1								
135B									
135A	2	Sample not tested - high resistance after sterilization							
135B									
135A	3								
135B									

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
136A	1	1 1/2	5 7/8	1 9/16	6 1/16	4.2	3.2	0.0019	0.0017
136B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0019	0.0018
136A	2	1 7/16	5 7/8	1 1/2	6 1/16	4.4	3.2	0.0019	0.0017
136B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0020	0.0017
136A	3	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0020	0.0016
136B		1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.4	0.0021	0.0017
137A	1								
137B									
137A	2	Sample not tested - high resistance							
137B									
137A	3								
137B									
138A	1	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0021
138B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0022
138A	2	1 7/16	5 13/16	1 1/2	6 1/16	4.4	4.3	0.0021	0.0022
138B		1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0020	0.0021
138A	3	1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0019	0.0020
138B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0022

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Samples No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
139A	1	1 7/16	5 3/8	1 1/2	5 3/4	4.4	7.0	0.0021	0.0020
139B		1 1/2	5 1/2	1 9/16	5 13/16	4.2	10.4	0.0020	0.0021
139A	2	1 7/16	5 7/16	1 1/2	5 3/4	4.4	5.7	0.0020	0.0021
139B		1 7/16	5 1/2	1 1/2	5 3/4	4.4	4.5	0.0019	0.0020
139A	3	1 1/2	5 7/16	1 9/16	5 13/16	4.2	6.9	0.0018	0.0019
139B		1 1/2	5 7/16	1 9/16	5 3/4	4.2	5.7	0.0018	0.0020
140A	1	1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0033	0.0026
140B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0033	0.0025
140A	2	1 1/2	5 13/16	1 9/16	6	4.2	3.2	0.0032	0.0025
140B		1 1/2	5 3/4	1 5/8	6 1/8	8.3	6.5	0.0033	0.0026
140A	3	1 7/16	5 15/16	1 1/2	6 7/16	4.4	8.4	0.0034	0.0025
140B		1 7/16	6	1 1/2	6 1/4	4.4	4.2	0.0032	0.0025

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
141A	1	1 7/16	4 13/16	1 9/16	5 1/16	8.8	5.2	0.0018	0.0018
141B		1 1/2	4 13/16	1 5/8	5	8.3	3.8	0.0019	0.0020
141A	2	1 1/2	4 11/16	1 9/16	5	4.2	6.7	0.0020	0.0019
141B		1 1/2	4 13/16	1 5/8	5 1/16	8.3	5.1	0.0020	0.0021
141A	3	1 1/2	4 15/16	1 9/16	5 3/16	4.2	5.1	0.0020	0.0020
141B		1 1/2	4 11/16	1 9/16	5	4.2	6.7	0.0019	0.0020
142A	1	1 1/2	5 11/16	1 5/8	6 1/16	8.4	6.6	0.0019	0.0020
142B		1 1/2	5 3/4	1 9/16	6	4.2	4.4	0.0021	0.0020
142A	2	1 1/2	5 7/8	1 5/8	6 1/4	8.4	6.3	0.0022	0.0023
142B		1 1/2	5 15/16	1 5/8	6 1/4	8.4	5.3	0.0023	0.0024
142A	3	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0025	0.0022
142B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0022	0.0022

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
143A	1	1 7/16	5 15/16	1 9/16	6 3/16	8.7	4.2	0.0017	0.0020
143B		1 7/16	5 7/8	1 9/16	6 1/8	8.7	4.3	0.0017	0.0021
143A	2	1 7/16	5 3/4	1 1/2	6 1/16	4.4	5.4	0.0017	0.0021
143B		1 7/16	5 15/16	1 9/16	6 1/4	8.7	5.2	0.0017	0.0020
143A	3	1 1/2	5 15/16	1 5/8	6 1/4	8.4	5.2	0.0018	0.0023
143B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0019	0.0022
144A	1	1 3/8	5 11/16	1 1/2	5 15/16	9.1	4.4	0.0019	0.0021
144B		1 3/8	5 3/4	1 1/2	6 1/16	9.1	5.4	0.0019	0.0020
144A	2	1 5/16	5 9/16	1 7/16	5 7/8	9.6	5.6	0.0018	0.0022
144B		1 1/2	5 11/16	1 5/8	6	9.1	5.5	0.0019	0.0020
144A	3	1 5/16	5 7/16	1 7/16	5 13/16	9.6	6.9	0.0020	0.0023
144B		1 5/16	5 3/4	1 1/2	6	14.3	4.4	0.0019	0.0021

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
145A	1	1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0017	0.0015
145B		1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0017	0.0017
145A	2	1 1/2	5 13/16	1 9/16	6 5/16	4.2	8.6	0.0019	0.0016
145B		1 7/16	5 3/4	1 1/2	6 1/4	4.4	8.8	0.0020	0.0018
145A	3	1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0017	0.0015
145B		1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0017	0.0016
146A	1	1 1/2	5 13/16	1 5/8	6 3/16	8.4	6.5	0.0014	0.0012
146B		1 7/16	5 3/4	1 1/2	6 1/4	4.4	8.7	0.0016	0.0012
146A	2	1 1/2	5 13/16	1 5/8	6 1/4	8.4	7.5	0.0016	0.0014
146B		1 7/16	5 13/16	1 9/16	6 3/16	8.4	6.5	0.0017	0.0014
146A	3	1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0017	0.0014
146B		1 1/2	5 3/4	1 9/16	6 1/8	4.2	6.5	0.0017	0.0013

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
147A	1	1 1/2	5 13/16	1 9/16	6 5/16	4.2	7.5	0.0019	0.0015
147B		1 1/2	6	1 9/16	6 9/16	4.2	9.4	0.0019	0.0016
147A	2	1 1/2	6	1 9/16	6 9/16	4.2	9.4	0.0025	0.0017
147B		1 1/2	5 15/16	1 5/8	6 1/2	8.7	5.3	0.0018	0.0016
147A	3	1 1/2	6	1 9/16	6 1/2	8.4	8.3	0.0019	0.0016
147B		1 1/2	5 7/8	1 5/8	6 3/8	8.7	8.5	0.0018	0.0016
148A	1	1 1/2	5 7/8	1 5/8	6 3/8	8.7	8.5	0.0016	0.0015
148B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0017	0.0016
148A	2	1 7/16	5 15/16	1 9/16	6 5/16	8.4	6.3	0.0017	0.0015
148B		1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0016	0.0015
148A	3	1 1/2	6	1 5/8	6 3/8	8.7	6.3	0.0016	0.0015
148B		1 7/16	5 7/8	1 1/2	6 5/16	4.4	7.5	0.0017	0.0016

Table 19 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
149A	1								
149B									
149A	2	Sample not tested - degraded during grafting							
149B									
149A	3								
149B									
150A	1								
150B									
150A	2	Sample not tested - degraded during grafting							
150B									
150A	3								
150B									
151A	1								
151B									
151A	2	Sample not tested - degraded during grafting							
151B									
151A	3								
151B									

Table 20

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
101A	1	1 7/16	5 7/8	1 5/8	6 5/8	13.0	12.8	0.0016	0.0019
101B		1 1/2	5 15/16	1 3/4	6 7/8	16.7	15.8	0.0015	0.0017
101A	2	1 1/2	5 7/8	1 3/4	6 13/16	16.7	17.2	0.0016	0.0018
101B		1 7/16	5 7/8	1 11/16	6 7/8	17.4	17.0	0.0016	0.0018
101A	3	1 7/16	5 7/8	1 5/8	6 7/8	13.0	17.0	0.0015	0.0017
101B		1 1/2	5 15/16	1 3/4	6 13/16	16.7	15.6	0.0017	0.0018
102A	1	1 1/2	6	1 11/16	6 13/16	12.5	13.5	0.0018	0.0019
102B		1 1/2	6	1 5/8	6 13/16	8.3	13.5	0.0018	0.0019
102A	2	1 1/2	5 7/8	1 5/8	6 3/4	8.3	16.7	0.0019	0.0021
102B		1 1/2	5 15/16	1 11/16	6 13/16	12.5	14.7	0.0018	0.0020
102A	3	1 1/2	6	1 11/16	6 7/8	12.5	14.6	0.0018	0.0019
102B		1 1/2	5 15/16	1 11/16	6 7/8	12.5	15.8	0.0018	0.0021

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of A Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
103A	1	1 3/8	5 7/8	1 1/2	6 3/16	9.1	9.1	0.0016	0.0017
103B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.2	0.0015	0.0016
103A	2	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0015	0.0018
103B		1 3/8	5 7/8	1 7/16	6 1/8	4.6	4.3	0.0015	0.0015
103A	3	1 1/2	5 15/16	1 5/8	6 3/16	8.3	8.3	0.0015	0.0017
103B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.4	0.0015	0.0017
104A	1	1 3/8	5 3/4	1 7/16	6 1/16	4.5	5.8	0.0012	0.0017
104B		1 1/4	5 11/16	1 5/16	6	5.0	5.5	0.0012	0.0019
104A	2	1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0011	0.0017
104B		1 3/8	5 13/16	1 7/16	6 1/8	4.5	5.4	0.0012	0.0017
104A	3	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0012	0.0018
104B		1 1/2	5 15/16	1 5/8	6 1/4	8.3	5.3	0.0010	0.0016

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
105A	1	1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.2	0.0009	0.0015
105B		1 1/2	6	1 3/16	6 3/16	4.2	3.1	0.0010	0.0013
105A	2	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0011	0.0015
105B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0010	0.0014
105A	3	1 7/16	5 3/4	1 1/2	6	4.4	4.4	0.0011	0.0013
105B		1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0010	0.0014
106A	1	1 3/8	5 1/2	1 7/16	5 13/16	4.5	5.8	0.0012	0.0013
106B		1 7/16	5 5/8	1 1/2	5 7/8	4.4	4.4	0.0011	0.0014
106A	2	1 1/2	5 15/16	1 5/8	6 5/16	8.3	6.3	0.0013	0.0014
106B		1 1/2	5 15/16	1 5/8	6 3/8	8.3	3.2	0.0011	0.0013
106A	3	1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0012	0.0014
106B		1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0011	0.0014

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
107A	1	1 7/16	5 3/4	1 9/16	6 3/16	8.3	7.6	0.0021	0.0016
107B		1 7/16	5 1/2	1 1/2	5 15/16	4.4	8.2	0.0021	0.0018
107A	2	1 1/2	5 9/16	1 5/8	6 1/16	8.3	9.0	0.0020	0.0017
107B		1 1/2	5 7/8	1 5/8	6 7/16	8.3	9.6	0.0024	0.0017
107A	3	1 1/2	5 13/16	1 9/16	6 1/8	4.2	5.4	0.0019	0.0016
107B		1 1/2	5 9/16	1 9/16	6	4.2	7.9	0.0020	0.0017
108A	1	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0009	0.0011
108B		1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0010	0.0012
108A	2	1 3/8	5 15/16	1 1/2	6 1/4	8.8	5.3	0.0010	0.0011
108B		1 3/8	5 7/8	1 7/16	6 3/16	4.6	5.3	0.0010	0.0011
108A	3	1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0009	0.0010
108B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0011	0.0011

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
109A	1	1 3/8	5 7/8	1 7/16	6 1/16	4.6	3.2	0.0014	0.0017
109B		1 7/16	6	1 1/2	6 1/8	4.4	2.1	0.0014	0.0016
109A	2	1 3/8	5 15/16	1 7/16	6 1/8	4.6	3.2	0.0017	0.0017
109B		1 7/16	5 7/8	1 9/16	6 1/16	8.6	3.2	0.0015	0.0016
109A	3	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0014	0.0017
109B		1 1/2	5 7/8	1 9/16	6 1/16	4.2	3.2	0.0015	0.0017
110A	1	1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0018	0.0016
110B		1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0021	0.0013
110A	2	1 1/2	6	1 9/16	6 1/4	4.2	4.1	0.0019	0.0016
110B		1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0020	0.0015
110A	3	1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0021	0.0016
110B		1 1/2	6	1 9/16	6 1/4	4.2	4.1	0.0020	0.0014

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
111A	1	1 1/2	6	1 9/16	6 7/16	4.2	7.3	0.0019	0.0017
111B		1 1/2	6	1 5/8	6 1/2	8.3	8.3	0.0016	0.0018
111A	2	1 1/2	6	1 9/16	6 7/16	4.2	7.3	0.0016	0.0018
111B		1 1/2	5 15/16	1 5/8	6 3/8	8.3	7.4	0.0016	0.0019
111A	3	1 1/2	6	1 5/8	6 1/2	8.3	8.3	0.0018	0.0018
111B		1 1/2	5 15/16	1 9/16	6 1/2	4.2	9.5	0.0016	0.0019
112A	1								
112B									
112A	2	Sample not tested - high resistance							
112B									
112A	3								
112B									
113A	1	1 1/2	5 3/4	1 5/8	6	8.3	4.4	0.0025	0.0022
113B		1 7/16	5 11/16	1 9/16	6 1/16	8.7	6.6	0.0023	0.0021
113A	2	1 1/2	5 3/4	1 9/16	5 15/16	4.2	3.3	0.0023	0.0022
113B		1 7/16	5 7/8	1 1/2	6 3/8	4.4	8.5	0.0024	0.0020
113A	3	1 7/16	5 11/16	1 9/16	6 1/4	8.7	10.1	0.0025	0.0021
113B		1 7/16	5 7/8	1 1/2	6 5/16	4.4	7.5	0.0025	0.0021

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
114A	1	1 3/8	5 13/16	1 7/16	6 1/8	4.6	5.4	0.0011	0.0012
114B		1 7/16	5 3/4	1 1/2	6 3/16	4.4	7.6	0.0013	0.0013
114A	2	1 3/8	5 7/8	1 7/16	6 1/8	4.6	4.3	0.0010	0.0011
114B		1 3/8	5 7/8	1 7/16	6 3/16	4.6	5.3	0.0010	0.0011
114A	3	1 3/8	5 3/4	1 3/8	6 1/16	0.0	5.4	0.0009	0.0010
114B		1 3/8	5 7/8	1 7/16	6 1/4	4.6	6.4	0.0010	0.0011
115A	1	1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0017	0.0020
115B		1 7/16	5 15/16	1 1/2	6 5/16	4.4	6.3	0.0018	0.0019
115A	2	1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0017	0.0019
115B		1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0017	0.0020
115A	3	1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.1	0.0018	0.0018
115B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0017	0.0019

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet ΔLength	ΔW (%)	L (%)	Thickness Dry	Thickness Wet
116A	1	1 1/2	5 15/16	1 9/16	6 5/16	4.2	6.4	0.0016	0.0019
116B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0019	0.0021
116A	2	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0019	0.0021
116B		1 1/2	6	1 9/16	6 3/8	4.2	6.3	0.0018	0.0020
116A	3	1 1/2	5 15/16	1 9/16	6 5/16	4.2	6.4	0.0020	0.0021
116B		1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0019	0.0021
117A	1	1 3/8	5 3/4	1 7/16	5 15/16	4.6	3.3	0.0009	0.0014
117B		1 7/16	5 15/16	1 1/2	6 1/8	4.4	3.2	0.0010	0.0015
117A	2	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0013	0.0013
117B		1 3/8	5 7/8	1 3/8	6 1/8	0.0	4.3	0.0011	0.0014
117A	3	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0010	0.0014
117B		1 7/16	5 15/16	1 7/16	6 3/16	0.0	4.2	0.0010	0.0014

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
118A	1	1 7/16	5 7/8	1 1/2	6 3/8	4.4	8.5	0.0021	0.0020
118B		1 1/2	6	1 1/2	6 7/16	0.0	7.3	0.0019	0.0020
118A	2	1 1/2	5 15/16	1 9/16	6 9/16	4.2	10.5	0.0020	0.0019
118B		1 1/2	5 15/16	1 9/16	6 1/2	4.2	9.5	0.0022	0.0019
118A	3	1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0020	0.0019
118B		1 7/16	5 15/16	1 1/2	6 1/2	4.4	9.5	0.0021	0.0019
119A	1	1 1/2	6	1 9/16	6 7/16	4.2	7.3	0.0020	0.0020
119B		1 7/16	5 15/16	1 1/2	6 1/2	4.4	9.5	0.0019	0.0020
119A	2	1 1/2	6	1 5/8	6 1/2	8.3	8.5	0.0020	0.0020
119B		1 1/2	6	1 9/16	6 7/16	4.2	7.3	0.0018	0.0019
119A	3	1 7/16	5 15/16	1 1/2	6 7/16	4.4	8.5	0.0019	0.0021
119B		1 1/2	5 15/16	1 9/16	6 3/8	4.2	7.4	0.0020	0.0021

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
120A	1	1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0009	0.0012
120B		1 7/16	5 15/16	1 1/2	6 1/8	4.4	3.2	0.0010	0.0012
120A	2	1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0010	0.0010
120B		1 7/16	5 7/8	1 1/2	6 1/16	4.4	3.2	0.0011	0.0012
120A	3	1 1/2	5 15/16	1 1/2	6 1/8	0.0	3.2	0.0010	0.0011
120B		1 7/16	5 7/8	1 1/2	6	4.4	2.1	0.0010	0.0012
121A	1	1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0014	0.0017
121B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0015	0.0016
121A	2	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0014	0.0017
121B		1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0013	0.0017
121A	3	1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0013	0.0018
121B		1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0014	0.0018

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
122A	1	1 1/4	5 3/16	1 3/8	5 3/4	10.1	10.8	0.0018	0.0021
112B		1 1/4	5 1/4	1 3/8	5 13/16	10.1	10.7	0.0018	0.0019
112A	2	1 5/16	5 3/16	1 3/8	5 7/8	4.8	13.2	0.0018	0.0021
112B		1 3/8	5 1/2	1 1/2	6 1/16	9.1	10.2	0.0018	0.0020
112A	3	1 1/4	5 1/4	1 3/8	5 7/8	10.1	11.9	0.0017	0.0020
112B		1 3/8	5 1/4	1 1/2	5 13/16	9.1	10.7	0.0018	0.0021
123A	1	1 7/16	5 15/16	1 9/16	6 1/4	8.7	5.3	0.0015	0.0017
123B		1 1/2	5 15/16	1 9/16	6 1/8	4.2	3.2	0.0014	0.0016
123A	2	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0014	0.0015
123B		1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0013	0.0016
123A	3	1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0013	0.0016
123B		1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0014	0.0016

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
124A	1	1 1/2	6	1 9/16	6 1/8	4.2	2.1	0.0015	0.0018
124B		1 1/2	6	1 9/16	6 3/16	4.2	3.1	0.0015	0.0018
124A	2	1 7/16	5 7/8	1 1/2	6 1/16	4.4	3.1	0.0013	0.0018
124B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0014	0.0019
124A	3	1 1/2	6	1 1/2	6 3/16	0.0	3.1	0.0015	0.0019
124B		1 1/2	6	1 1/2	6 1/4	0.0	4.2	0.0015	0.0019
125A	1	1 1/2	5	1 9/16	5 1/2	4.2	10.0	0.0017	0.0019
125B		1 1/2	5	1 9/16	5 1/2	4.2	10.0	0.0017	0.0020
125A	2	1 7/16	4 7/8	1 1/2	5 5/16	4.4	9.0	0.0016	0.0019
125B		1 1/2	5	1 1/2	5 7/16	0.0	8.8	0.0017	0.0019
125A	3	1 1/2	4 15/16	1 9/16	5 1/2	4.2	11.2	0.0017	0.0018
125B		1 1/2	4 15/16	1 9/16	5 3/8	4.2	8.9	0.0018	0.0020

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
126A	1	1 7/16	5 15/16	1 9/16	6 1/2	8.6	9.5	0.0011	0.0015
126B		1 7/16	5 7/8	1 1/2	6 7/16	4.4	9.4	0.0012	0.0016
126A	2	1 1/2	6	1 9/16	6 1/2	4.2	8.3	0.0010	0.0015
126B		1 1/2	6	1 9/16	6 9/16	4.2	9.4	0.0011	0.0015
126A	3	1 1/2	6	1 1/2	6 7/16	0.0	7.3	0.0010	0.0016
126B		1 1/2	6	1 1/2	6 7/16	0.0	7.3	0.0011	0.0016
127A	1	1 1/2	5 7/8	1 5/8	6 1/4	8.3	6.4	0.0019	0.0020
127B		1 7/16	5 13/16	1 1/2	6 1/8	4.4	5.4	0.0018	0.0021
127A	2	1 1/2	5 7/8	1 9/16	6 1/4	4.2	6.4	0.0018	0.0020
127B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0017	0.0019
127A	3	1 7/16	5 3/4	1 9/16	6 1/16	8.7	5.4	0.0018	0.0020
127B		1 1/2	5 7/8	1 5/8	6 1/4	8.3	6.4	0.0018	0.0020

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
128A	1	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0017	0.0017
128B		1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0016	0.0016
128A	2	1 1/2	5 15/16	1 1/2	6 1/4	0.0	5.3	0.0016	0.0016
128B		1 1/2	5 15/16	1 9/16	6 5/16	4.2	6.4	0.0016	0.0017
128A	3	1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0015	0.0016
128B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0016	0.0016
129A	1	1 7/16	5 15/16	1 1/2	6 5/16	4.4	6.4	0.0010	0.0011
129B		1 7/16	5 15/16	1 9/16	6 5/16	8.6	6.4	0.0009	0.0011
129A	2	1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0011	0.0012
129B		1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0010	0.0012
129A	3	1 1/2	6	1 9/16	6 5/16	4.2	5.3	0.0010	0.0012
129B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0011	0.0011

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
130A	1	1 1/2	5 7/8	1 9/16	6 1/8	4.2	4.3	0.0018	0.0019
130B		1 1/2	5 15/16	1 1/2	6 1/4	0.0	5.3	0.0018	0.0019
130A	2	1 7/16	5 7/8	1 7/16	6 3/16	0.0	5.4	0.0017	0.0018
130B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0017	0.0019
130A	3	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0018	0.0020
130B		1 1/2	5 15/16	1 1/2	6 1/4	0.0	5.3	0.0017	0.0019
131A	1								
131B									
131A	2	Sample not tested - high resistance							
131B									
131A	3								
131B									
132A	1	1 7/16	5 3/4	1 1/2	6 1/8	4.4	6.5	0.0025	0.0023
132B		1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0023	0.0021
132A	2	1 1/2	5 3/4	1 9/16	6 1/16	4.2	5.4	0.0025	0.0021
132B		1 7/16	5 11/16	1 1/2	6	4.4	5.5	0.0024	0.0024
132A	3	1 7/16	5 7/8	1 1/2	6 1/4	4.4	6.4	0.0024	0.0022
132B		1 7/16	5 7/8	1 1/2	6 5/16	4.4	8.1	0.0024	0.0024

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
133A	1	1 1/2	5 5/8	1 1/2	6	0.0	6.7	0.0021	0.0021
133B		1 1/2	5 7/8	1 1/2	6 1/4	0.0	5.4	0.0021	0.0022
133A	2	1 7/16	5 7/8	1 9/16	6 1/4	8.7	5.4	0.0022	0.0021
133B		1 1/2	5 13/16	1 9/16	6 3/16	4.2	6.5	0.0023	0.0020
133A	3	1 1/2	5 7/8	1 9/16	6 1/4	4.2	5.4	0.0021	0.0022
133B		1 7/16	5 3/4	1 1/2	6 1/16	4.4	5.4	0.0021	0.0023
134A	1								
134B									
134A	2	Sample not tested - high resistance							
134B									
134A	3								
134B									
135A	1								
135B									
135A	2	Samples not tested - high resistance after sterilization							
135B									
135A	3								
135B									

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
136A	1	1 1/2	5 15/16	1 9/16	6 5/16	4.2	6.3	0.0019	0.0019
136B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0019
136A	2	1 1/2	6	1 9/16	6 3/16	4.2	3.1	0.0020	0.0018
136B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0017
136A	3	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0018
136B		1 1/2	6	1 9/16	6 5/16	4.2	6.4	0.0020	0.0018
137A	1								
137B									
137A	2	Samples not tested - high resistance							
137B									
137A	3								
137B									
138A	1	1 1/2	6	1 1/2	6 7/16	0.0	7.3	0.0020	0.0022
138B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0021	0.0021
138A	2	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0021
138B		1 1/2	5 15/16	1 1/2	6 3/8	0.0	7.4	0.0020	0.0021
138A	3	1 7/16	5 7/8	1 7/16	6 3/16	0.0	5.4	0.0019	0.0020
138B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0020	0.0021

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
139A	1	1 1/2	5 3/4	1 9/16	6 1/16	4.2	5.4	0.0020	0.0021
139B		1 7/16	5 5/8	1 1/2	5 15/16	4.4	7.8	0.0021	0.0022
139A	2	1 7/16	5 5/8	1 1/2	5 7/8	4.4	4.4	0.0019	0.0021
139B		1 7/16	5 9/16	1 1/2	5 7/8	4.4	5.6	0.0021	0.0020
139A	3	1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.4	0.0020	0.0020
139B		1 7/16	5 3/4	1 1/2	6 1/16	4.4	5.4	0.0020	0.0020
140A	1	1 1/2	6	1 9/16	6 3/8	4.2	6.2	0.0033	0.0027
140B		1 1/2	6	1 5/8	6 5/16	8.3	5.2	0.0032	0.0025
140A	2	1 1/2	6	1 9/16	6 3/8	4.2	6.2	0.0032	0.0026
140B		1 1/2	6	1 9/16	6 3/8	4.2	9.4	0.0035	0.0024
140A	3	1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.4	0.0034	0.0024
140B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0033	0.0025

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
141A	1	1 7/16	4 7/8	1 1/2	5 1/8	4.4	5.1	0.0018	0.0021
141B		1 7/16	4 13/16	1 9/16	5 1/16	8.3	5.2	0.0021	0.0020
141A	2	1 1/2	4 3/4	1 9/16	5 1/16	4.2	6.6	0.0019	0.0021
141B		1 7/16	4 7/8	1 1/2	5 3/16	4.4	6.6	0.0019	0.0020
141A	3	1 1/2	4 13/16	1 9/16	5 1/8	4.2	6.5	0.0021	0.0020
141B		1 1/2	4 13/16	1 1/2	5 1/8	0.0	6.5	0.0019	0.0020
142A	1	1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.4	0.0025	0.0021
142B		1 1/2	5 15/16	1 9/16	6 5/16	4.2	6.4	0.0022	0.0021
142A	2	1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0021	0.0021
142B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0020
142A	3	1 1/2	6	1 9/16	6 3/8	4.2	6.3	0.0020	0.0022
142B		1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0020	0.0020

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
143A	1	1 7/16	5 15/16	1 9/16	6 1/4	8.7	5.3	0.0019	0.0022
143B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0019	0.0022
143A	2	1 1/2	6	1 9/16	6 5/16	4.2	5.2	0.0017	0.0020
143B		1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0018	0.0021
143A	3	1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0017	0.0020
143B		1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0017	0.0021
144A	1	1 1/2	6	1 5/8	6 1/4	8.3	4.2	0.0019	0.0021
144B		1 1/2	6	1 5/8	6 1/4	8.3	4.2	0.0018	0.0021
144A	2	1 7/16	5 7/8	1 9/16	6 1/8	8.7	4.3	0.0019	0.0022
144B		1 1/2	6	1 5/8	6 5/16	8.3	5.2	0.0019	0.0023
144A	3	1 7/16	5 15/16	1 1/2	6 3/16	4.4	4.2	0.0021	0.0023
144B		1 7/16	5 7/8	1 9/16	6 1/8	8.7	4.3	0.0019	0.0023

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
145A	1	1 1/2	6	1 9/16	6 3/8	4.2	6.3	0.0020	0.0016
145B		1 1/2	6	1 5/8	6 1/4	8.3	4.2	0.0017	0.0015
145A	2	1 1/2	6	1 9/16	6 1/4	4.2	4.2	0.0017	0.0015
145B		1 1/2	6	1 9/16	6 5/16	4.2	5.3	0.0018	0.0015
145A	3	1 1/2	5 15/16	1 9/16	6 1/4	4.2	5.3	0.0017	0.0016
145B		1 7/16	5 7/8	1 1/2	6 3/16	4.4	5.3	0.0017	0.0015
146A	1	1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0017	0.0013
146B		1 7/16	5 13/16	1 1/2	6 1/16	4.4	4.3	0.0017	0.0012
146A	2	1 1/2	5 7/8	1 5/8	6 1/8	8.3	4.3	0.0016	0.0014
146B		1 7/16	5 3/4	1 9/16	6 1/16	8.7	5.4	0.0017	0.0014
146A	3	1 1/2	5 7/8	1 9/16	6 3/16	4.2	5.3	0.0016	0.0012
146B		1 1/2	5 7/8	1 5/8	6 1/4	8.3	6.3	0.0016	0.0012

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	ΔW (%)	ΔL (%)	Thickness Dry	Thickness Wet
147A	1	1 1/2	6	1 9/16	6 5/16	4.2	5.3	0.0018	0.0016
147B		1 7/16	5 7/8	1 1/2	6 1/8	4.4	4.3	0.0019	0.0016
147A	2	1 7/16	5 15/16	1 1/2	6 1/4	4.4	5.3	0.0019	0.0015
147B		1 1/2	6	1 9/16	6 5/16	4.2	5.3	0.0017	0.0015
147A	3	1 1/2	6	1 9/16	6 5/16	4.2	5.3	0.0019	0.0016
147B		1 1/2	6	1 9/16	6 5/16	4.2	5.3	0.0019	0.0016
148A	1	1 1/2	5 15/16	1 5/8	6 1/4	8.3	5.3	0.0015	0.0016
148B		1 1/2	5 15/16	1 5/8	6 1/4	8.3	5.3	0.0017	0.0016
148A	2	1 1/2	5 15/16	1 9/16	6 3/16	4.2	4.2	0.0017	0.0017
148B		1 7/16	5 15/16	1 9/16	6 1/4	8.6	5.3	0.0014	0.0015
148A	3	1 1/2	6	1 5/8	6 5/16	8.3	5.3	0.0015	0.0016
148B		1 1/2	6	1 9/16	6 3/8	4.2	6.2	0.0017	0.0016

Table 20 (Continued)

Dimensional Changes of Samples Sterilized in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample No.	Ster. No.	Dry Width	Dry Length	Wet Width	Wet Length	W (%)	L (%)	Thickness Dry	Thickness Wet
149A	1								
149B									
149A	2	Samples not tested - degraded during grafting							
149B									
149A	3								
149B									
150A	1								
150B									
150A	2	Samples not tested - degraded during grafting							
150B									
150A	3								
150B									
151A	1								
151B									
151A	2	Samples not tested - degraded during grafting							
151B									
151A	3								
151B									

Table 21

Electrical Resistance of the Samples After Thermal Sterilization in 40% KOH at 145°C (milliohms-in^2)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	28	28	35
101B	29	33	24
102A	14	16	16
102B	17	20	14
103A	70	65	67
103B	63	72	72
104A	26	23	22
104B	20	28	23
105A	33	37	33
105B	34	35	41
106A	37	40	38
106B	42	34	37
107A	43	50	49
107B	51	51	47
108A	56	54	54
108B	53	60	55
109A	75	74	64
109B	71	70	74
110A	39	41	41
110B	43	40	39

Table 21 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	42	40	43
111B	44	36	46
112A	Sample not tested - high resistance		
112B	" " "	"	"
113A	14	20	26
113B	23	16	19
114A	20	17	17
114B	22	18	22
115A	20	17	19
115B	18	16	24
116A	27	23	15
116B	30	23	20
117A	26	15	30
117B	24	31	20
118A	45	38	36
118B	41	35	43
119A	56	24	23
119B	38	27	21
120A	47	53	32
120B	46	37	40

Table 21 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	34	56	33
121B	64	31	35
122A	*	484	476
122B	527	*	432
123A	31	24	31
123B	27	33	22
124A	35	38	41
124B	40	38	33
125A	37	45	37
125B	34	39	41
126A	72	69	*
126B	75	65	81
127A	33	37	35
127B	39	32	40
128A	60	63	49
128B	65	57	61
129A	44	34	34
129B	32	47	33
130A	23	27	22
130B	25	29	21

Table 21 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	71	84	73
132B	63	80	80
133A	29	33	37
133B	33	30	32
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	32	41	37
136B	38	40	43
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	70	64	53
138B	81	71	50
139A	34	40	33
139B	31	37	31
140A	90	69	54
140B	79	76	88

Table 21 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	82	67	80
141B	73	75	76
142A	60	50	62
142B	50	53	57
143A	31	37	33
143B	37	40	35
144A	217	114	110
144B	171	129	93
145A	60	70	51
145B	45	62	48
146A	41	52	35
146B	37	36	40
147A	39	37	33
147B	33	35	38
148A	35	37	41
148B	40	36	33

*Samples too narrow for resistance measurement

Table 22

Electrical Resistance After Thermal Sterilization in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	33	26	28
101B	28	30	24
102B	16	18	19
102B	20	14	19
103A	62	70	64
103B	67	60	73
104A	24	28	25
104B	21	26	28
105A	35	32	38
105B	33	35	37
106A	36	41	39
106B	38	33	40
107A	48	40	46
107B	44	45	42
108A	55	52	59
108B	60	55	56
109A	72	70	70
109B	68	73	71
110A	37	34	39
110B	32	33	31

Table 22 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	39	46	41
111B	48	43	37
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	22	17	25
113B	20	23	21
114A	18	20	16
114B	17	14	19
115A	15	22	17
115B	20	13	21
116A	24	24	16
116B	20	18	23
117A	31	28	33
117B	29	33	30
118A	42	40	35
118B	39	43	37
119A	39	27	23
119B	26	29	32
120A	52	54	42
120B	50	49	44

Table 22 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	31	37	62
121B	35	47	51
122A	502	456	493
122B	517	508	462
123A	30	27	29
123B	31	25	32
124A	36	43	38
124B	40	41	39
125A	38	33	46
125B	47	37	42
126A	77	69	63
126B	66	70	74
127A	31	38	39
127B	33	35	30
128A	57	61	52
128B	60	63	49
129A	41	35	39
129B	39	33	34
130A	24	24	20
130B	23	20	17

Table 22 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	75	74	82
132B	61	80	63
133A	35	36	35
133B	30	41	33
134B	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	37	46	40
136B	36	35	38
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	75	73	74
138B	80	71	77
139A	39	40	37
139B	32	41	33
140A	102	90	80
140B	96	78	71

Table 22 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	62	75	60
141B	81	77	64
142A	47	52	56
142B	53	55	59
143A	37	30	36
143B	35	33	32
144A	62	70	57
144B	77	73	60
145A	37	42	33
145B	38	45	42
146A	35	37	38
146B	39	30	32
147A	36	32	32
147B	35	37	35
148A	34	42	45
148B	35	33	27

Table 23

Electrical Resistance after Thermal Sterilization in 40% KOH at 137°C

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	20	20	38
101B	23	25	29
102A	24	22	26
102B	19	27	21
103A	33	38	35
103B	33	36	34
104A	35	25	79
104B	31	38	33
105A	29	22	24
105B	32	28	33
106A	31	28	31
106B	35	30	38
107A	28	28	28
107B	33	34	31
108A	58	43	84
108B	67	38	48
109A	103	96	83
109B	91	101	77
110A	37	40	41
110B	36	38	33

Table 23 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	24	29	37
111B	27	40	33
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	28	18	30
113B	22	31	23
114A	24	24	24
114B	27	20	24
115A	20	32	29
115B	31	24	27
116A	13	13	18
116B	13	19	14
117A	28	31	33
117B	30	38	33
118A	36	38	38
118B	39	42	40
119A	19	34	23
119B	18	23	29
120A	40	48	32
120B	30	32	33

Table 23 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	76	43	53
121B	47	49	57
122A	47	70	41
122B	75	35	70
123A	10	10	12
123B	17	11	12
124A	15	7	20
124B	19	20	11
125A	20	90	145
125B	17	42	50
126A	95	35	80
126B	77	84	71
127A	10	10	8
127B	17	11	14
128A	117	145	119
128B	150	150	150
129A	10	10	19
129B	15	9	10
130A	10	15	15
130B	9	16	11

Table 23 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	67	67	71
132B	61	74	63
133A	28	34	52
133B	37	27	35
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	85	94	79
136B	71	88	67
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	62	71	88
138B	75	74	79
139A	28	25	22
139B	28	22	27
140A	92	84	69
140B	81	72	81

Table 23 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	58	47	37
141B	39	45	46
142A	44	58	22
142B	47	31	53
143A	12	20	21
143B	17	14	19
144A	78	125	112
144B	73	90	101
145A	61	59	42
145B	49	50	54
146A	38	40	31
146B	44	38	32
147A	36	31	28
147B	30	33	27
148A	91	81	97
148B	96	78	101
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 24

Electrical Resistance after Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	24	24	20
101B	19	27	19
102A	23	30	21
102B	24	23	27
103A	35	30	31
103B	37	40	30
104A	34	32	29
104B	31	37	34
105A	27	35	34
105B	36	30	30
106A	37	38	30
106B	31	32	38
107A	27	30	37
107B	33	26	34
108A	42	70	42
108B	49	51	67
109A	80	81	100
109B	103	72	77
110A	37	38	42
110B	40	38	41

Table 24 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	29	26	27
111B	24	30	25
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	19	37	30
113B	24	23	21
114A	29	28	26
114B	21	20	21
115A	33	40	22
115B	26	25	37
116A	17	13	20
116B	12	19	14
117A	31	26	28
117B	25	30	27
118A	40	42	38
118B	34	41	47
119A	27	21	22
119B	19	20	22
120A	33	45	40
120B	41	30	35

Table 24 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	43	47	58
121B	50	53	39
122A	61	43	84
122B	39	70	57
123A	16	11	12
123B	9	17	9
124A	21	14	18
124B	17	12	16
125A	19	71	59
125B	22	83	87
126A	87	81	74
126B	67	70	79
127A	12	9	12
127B	12	16	17
128A	90	163	225
128B	192	170	107
129A	8	11	20
129B	16	10	11
130A	12	19	10
130B	10	11	11

Table 24 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	70	74	65
132B	60	77	70
133A	33	27	31
133B	21	30	35
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	69	80	90
136B	70	84	91
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	71	67	71
138B	78	70	69
139A	24	22	31
139B	30	21	23
140A	84	79	71
140B	75	73	70

Table 24 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	33	50	35
141B	42	61	43
142A	43	44	41
142B	40	47	40
143A	17	21	23
143B	17	22	20
144A	79	74	80
144B	81	74	70
145A	50	51	47
145B	43	49	65
146A	41	45	32
146B	44	40	37
147A	39	30	31
147B	29	34	35
148A	91	95	95
148B	99	103	87
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 25

Exchange Capacity after Thermal Sterilization in 40% KOH at 145°C (meq/gm)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	6.82	6.47	6.48
101B	6.56	6.72	6.43
102A	5.52	6.14	6.23
102B	6.02	5.91	6.18
103A	5.16	5.14	4.99
103B	5.03	5.16	4.92
104A	5.47	5.48	5.44
104B	5.51	5.55	5.40
105A	6.56	6.50	6.71
105B	6.66	6.75	6.49
106A	4.62	4.56	4.50
106B	4.81	4.38	4.57
107A	6.19	5.75	6.41
107B	5.91	6.23	5.88
108A	5.07	4.41	5.01
108B	4.99	4.75	5.04
109A	2.70	2.64	2.60
109B	2.58	2.65	2.75
110A	4.81	4.88	5.10
110B	5.08	4.92	4.87

Table 25 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	7.22	7.48	6.30
111B	6.77	7.01	7.32
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	7.03	5.01	7.16
113B	6.84	6.91	7.08
114A	4.27	4.44	5.18
114B	5.16	4.33	4.16
115A	5.81	6.73	6.18
115B	6.01	6.80	5.96
116A	7.10	7.30	6.81
116B	6.85	7.00	7.27
117A	4.77	5.00	4.72
117B	4.81	4.72	4.96
118A	5.24	5.13	4.99
118B	5.28	5.30	5.02
119A	6.56	6.53	6.46
119B	6.49	6.58	6.41
120A	5.05	4.57	5.07
120B	4.92	4.77	5.01

Table 25 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	4.57	3.65	3.51
121B	3.81	3.66	4.11
122A	1.47	1.75	2.03
122B	1.91	1.60	1.83
123A	2.63	3.53	2.68
123B	2.87	3.11	3.20
124A	3.20	3.62	3.23
124B	3.33	3.42	3.54
125A	3.09	3.89	4.07
125B	3.91	3.70	3.13
126A	2.29	1.64	2.35
126B	1.87	2.37	2.18
127A	2.87	3.06	3.07
127B	3.01	3.10	3.03
128A	3.66	3.10	2.60
128B	3.71	3.45	3.07
129A	3.21	3.30	3.22
129B	3.33	3.28	3.16
130A	4.31	3.75	4.16
130B	4.28	4.01	4.19

Table 25 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	3.71	3.45	3.35
132B	3.20	3.24	3.67
133A	4.50	4.62	4.35
133B	4.31	4.37	4.41
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	4.40	4.27	4.28
136B	4.45	4.44	4.37
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	3.52	3.47	3.51
138B	3.61	3.70	3.37
139A	4.51	4.47	4.38
139B	4.63	4.51	4.50
140A	3.59	3.79	3.84
140B	3.82	3.90	3.93

Table 25 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	3.73	3.80	3.57
141B	3.80	3.64	3.62
142A	3.45	3.28	3.40
142B	3.31	3.57	3.36
143A	4.47	4.51	4.47
143B	4.65	4.39	4.44
144A	3.21	3.19	3.21
144B	3.15	3.19	3.30
145A	4.51	4.55	4.57
145B	4.60	4.63	4.67
146A	4.73	4.91	4.83
146B	4.62	4.80	4.75
147A	5.21	5.17	5.62
147B	5.33	5.21	5.22
148A	4.04	3.84	3.82
148B	3.72	4.11	3.91
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 26

Exchange Capacity after Thermal Sterilization in 40% KOH at 145°C in the Presence of a Silver Electrode (meq/gm)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	6.37	6.52	6.41
101B	5.99	6.27	6.61
102A	6.20	5.64	5.98
102B	5.73	5.87	6.07
103A	5.13	5.02	5.19
103B	4.97	5.15	5.13
104A	5.36	5.61	5.41
104B	5.51	5.58	5.34
105A	6.63	6.59	6.03
105B	6.40	6.36	6.11
106A	4.47	4.53	4.57
106B	4.35	4.40	4.59
107A	6.11	5.93	6.09
107B	6.03	6.06	6.15
108A	5.13	4.91	5.04
108B	4.87	5.02	5.09
109A	2.58	2.69	2.64
109B	2.65	2.52	2.70
110A	4.83	5.07	4.85
110B	4.74	5.14	4.91

Table 26 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	7.27	7.10	7.37
111B	7.13	7.23	7.30
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	6.71	7.08	6.54
113B	6.92	6.81	6.60
114A	4.31	4.63	5.10
114B	4.74	4.68	4.47
115A	6.02	6.27	7.11
115B	6.31	6.09	6.76
116A	7.12	6.91	7.41
116B	7.14	7.21	7.32
117A	5.08	4.71	4.93
117B	4.81	4.96	5.01
118A	5.31	5.08	4.76
118B	4.94	5.15	5.28
119A	6.69	6.51	6.43
119B	6.47	6.72	6.58
120A	5.12	4.79	4.61
120B	4.60	4.98	5.04

Table 26 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	3.88	3.49	3.70
121B	3.33	3.81	3.57
122A	1.31	2.14	1.97
122B	2.02	1.91	2.10
123A	3.29	2.76	2.71
123B	2.60	2.79	2.64
124A	3.31	3.25	3.57
124B	3.28	3.35	3.31
125A	3.62	4.01	3.57
125B	3.59	3.65	3.92
126A	1.85	2.42	2.31
126B	2.02	2.27	2.39
127A	3.11	2.93	3.01
127B	2.97	3.06	3.03
128A	3.78	3.05	2.66
128B	2.79	3.08	3.14
129A	3.19	3.24	3.36
129B	3.25	3.39	3.29
130A	4.09	3.98	4.25
130B	3.91	4.07	4.17

Table 26 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	3.51	3.26	3.38
132B	3.37	3.41	3.53
133A	4.61	4.32	4.17
133B	4.37	4.55	4.50
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	4.57	4.32	4.37
136B	4.61	4.54	4.36
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	3.47	3.23	3.68
138B	3.30	3.71	3.57
139A	4.23	4.45	4.32
139B	4.61	4.70	4.22
140A	3.55	3.66	3.34
140B	3.60	3.42	3.56

Table 26 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	3.68	3.51	3.42
141B	3.54	3.70	3.33
142A	3.51	3.27	3.35
142B	3.60	3.54	3.49
143A	4.54	4.71	4.42
143B	4.63	4.38	4.57
144A	3.37	3.51	3.14
144B	3.15	3.23	3.57
145A	4.55	4.62	4.71
145B	4.70	4.38	4.53
146A	4.74	4.33	4.28
146B	4.51	4.73	4.47
147A	5.10	5.20	5.27
147B	5.03	5.16	5.50
148A	3.81	3.74	3.71
148B	3.92	3.56	3.63

Table 27

Exchange Capacity after Thermal Sterilization in 40% KOH at 137°C

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	6.24	5.79	5.77
101B	5.82	6.71	5.43
102A	5.45	5.74	5.32
102B	6.33	5.76	6.08
103A	4.84	5.11	4.82
103B	4.79	4.93	5.71
104A	5.42	5.70	5.77
104B	5.88	6.02	5.61
105A	6.36	5.73	6.12
105B	5.95	6.16	6.14
106A	4.60	4.85	4.56
106B	4.39	4.61	4.90
107A	6.12	6.37	6.16
107B	6.23	6.40	6.28
108A	5.15	5.03	4.92
108B	5.18	4.87	4.98
109A	2.73	2.91	2.90
109B	2.47	2.78	2.75
110A	5.14	5.12	4.94
110B	5.26	4.89	5.17

Table 27 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	7.04	7.13	7.31
111B	7.22	7.30	7.15
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	6.85	7.15	6.74
113B	7.09	6.93	7.28
114A	4.53	4.39	4.55
114B	4.75	4.71	4.38
115A	6.18	6.21	6.36
115B	6.54	6.47	6.80
116A	6.71	7.04	7.12
116B	7.08	6.77	6.86
117A	4.80	4.93	4.97
117B	4.78	4.95	4.84
118A	5.01	5.20	5.15
118B	4.93	5.26	4.98
119A	6.38	6.42	6.44
119B	6.50	6.35	6.47
120A	4.76	4.84	5.10
120B	4.61	5.03	4.91

Table 27 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	2.22	1.97	1.99
121B	2.16	2.13	2.40
122A	2.17	2.20	2.28
122B	2.34	2.11	2.46
123A	2.36	2.50	2.36
123B	2.31	2.49	2.44
124A	3.60	3.31	3.51
124B	3.46	3.29	3.38
125A	3.71	3.80	3.70
125B	3.55	3.62	3.59
126A	2.21	2.27	2.05
126B	2.05	1.90	1.96
127A	3.14	3.20	3.17
127B	3.00	2.94	2.78
128A	3.26	2.91	3.18
128B	2.84	3.41	3.03
129A	3.30	2.85	2.96
129B	3.24	2.91	3.41
130A	4.21	3.83	4.20
130B	3.91	4.18	4.04

Table 27 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	3.34	3.71	3.47
132B	3.75	3.51	3.68
133A	4.43	4.46	4.65
133B	4.55	4.72	4.62
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	4.37	4.67	4.71
136B	4.62	4.50	4.33
137A	Sample not tested		
137B	" " "		
138A	3.51	3.74	3.37
138B	3.26	3.35	3.40
139A	4.60	4.43	4.26
139B	4.55	4.28	4.28
140A	3.51	3.66	3.79
140B	3.52	3.42	3.46

Table 27 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	3.29	3.65	3.61
141B	3.27	3.32	3.52
142A	3.50	3.37	3.19
142B	3.22	3.47	3.50
143A	4.42	4.62	4.51
143B	4.58	4.58	4.66
144A	3.30	3.15	3.26
144B	3.19	3.13	3.28
145A	4.64	4.40	4.31
145B	4.18	4.70	4.26
146A	4.79	4.65	4.77
146B	4.82	4.52	4.62
147A	5.23	5.20	5.22
147B	5.11	5.57	5.05
148A	3.64	3.86	3.61
148B	3.78	3.71	3.75
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 28

Exchange Capacity after Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	6.16	5.68	6.11
101B	5.95	5.74	5.80
102A	6.41	6.17	6.33
102B	6.35	6.40	6.42
103A	5.14	5.26	4.83
103B	4.85	5.21	4.77
104A	5.71	6.22	5.73
104B	5.90	6.17	5.45
105A	6.13	5.78	5.77
105B	5.80	5.75	6.16
106A	4.77	4.90	4.75
106B	4.80	4.81	4.87
107A	5.93	6.15	6.22
107B	6.20	6.06	6.17
108A	5.13	4.83	5.36
108B	4.97	5.25	4.91
109A	2.88	2.86	2.79
109B	2.82	3.12	2.91
110A	4.89	5.13	4.94
110B	4.90	5.01	4.90

Table 28 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	6.83	7.20	7.08
111B	6.94	6.96	7.21
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	7.20	6.76	6.83
113B	7.15	6.94	6.79
114A	4.44	4.88	4.72
114B	4.71	4.35	4.34
115A	6.07	6.10	6.09
115B	6.15	6.23	6.19
116A	7.13	7.05	7.18
116B	7.10	7.20	7.23
117A	5.03	4.83	5.14
117B	5.10	4.75	5.21
118A	5.21	5.07	5.10
118B	5.13	5.30	5.16
119A	6.51	6.23	6.46
119B	6.70	6.57	6.55
120A	4.68	4.84	4.73
120B	4.73	5.06	4.71

Table 28 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	2.21	2.15	2.15
121B	2.07	2.30	2.10
122A	2.12	2.23	2.16
122B	2.07	2.37	2.31
123A	2.35	2.21	2.15
123B	2.30	2.46	2.23
124A	3.40	3.51	3.60
124B	3.18	3.37	3.51
125A	3.28	3.72	3.85
125B	3.64	3.61	3.88
126A	2.17	2.24	2.12
126B	2.03	2.10	2.16
127A	3.14	3.07	3.06
127B	3.05	3.03	3.11
128A	2.83	3.10	3.18
128B	2.85	3.03	3.11
129A	2.94	2.83	3.17
129B	2.97	3.14	3.20
130A	4.38	4.17	4.21
130B	4.10	3.82	4.10

Table 28 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	3.67	3.58	3.39
132B	3.44	3.73	3.51
133A	4.56	4.67	4.72
133B	4.52	4.66	4.81
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	4.65	4.51	4.74
136B	4.37	4.23	4.64
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	3.50	3.67	3.23
138B	3.21	3.50	3.68
139A	4.24	4.62	4.73
139B	4.51	4.47	4.57
140A	3.35	3.25	3.37
140B	3.40	3.26	3.70

Table 28 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	3.54	3.37	3.29
141B	3.41	3.26	3.58
142A	3.31	3.19	3.26
142B	3.24	3.37	3.23
143A	4.45	4.46	4.27
143B	4.51	4.38	4.39
144A	3.20	3.50	3.36
144B	3.23	3.19	3.17
145A	4.23	4.30	4.20
145B	4.82	4.21	4.13
146A	5.02	4.95	4.78
146B	4.93	4.90	4.92
147A	5.22	5.27	5.35
147B	5.16	5.30	5.16
148A	3.61	3.72	3.70
148B	3.24	3.77	3.65
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 29

Tensile Strength After Thermal Sterilization in 40% KOH at 145°C

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	669	669	836
101B	810	675	675
102A	352	282	352
102B	1282	375	410
103A	1560	1560	1560
103B	1560	1480	1560
104A	1543	2101	1432
104B	1876	1621	1900
105A	668	780	668
105B	700	700	696
106A	1604	1719	1528
106B	1530	1667	1719
107A	550	550	472
107B	550	550	550
108A	412	309	309
108B	309	412	375
109A	629	550	157
109B	550	550	193
110A	947	1210	947
110B	968	968	1210

Table 29 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	211	141	127
111B	223	141	141
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	857	1002	1145
113B	1002	1002	879
114A	670	534	530
114B	693	525	525
115A	282	845	141
115B	332	291	164
116A	1214	1460	852
116B	1324	1214	1105
117A	1505	1145	893
117B	1260	901	1145
118A	890	986	668
118B	668	712	712
119A	973	1145	1095
119B	1077	1095	973
120A	286	309	260
120B	309	255	296

Table 29 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	1254	1409	1338
121B	1409	1428	1262
122A	700	509	445
122B	735	437	509
123A	167	167	95
123B	174	109	<50
124A	236	157	157
124B	202	168	187
125A	740	666	444
125B	687	666	430
126A	148	<50	< 50
126B	<50	<50	140
127A	468	267	267
127B	388	267	307
128A	551	629	563
128B	601	540	551
129A	206	206	514
129B	206	500	206
130A	890	592	668
130B	771	628	592

Table 29 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	471	1021	914
132B	943	836	1072
133A	1067	473	669
133B	945	592	944
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested -high resistance after sterilization		
135B	" " " " " " "		
136A	967	1042	875
136B	843	905	884
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	496	727	939
138B	885	821	1040
139A	923	717	924
139B	476	1011	868
140A	602	1212	913
140B	1103	1110	741

Table 29 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	743	922	641
141B	817	816	710
142A	1015	868	914
142B	873	773	743
143A	840	854	1043
143B	1187	927	798
144A	1231	1137	1240
144B	1271	1174	1245
145A	1139	726	813
145B	931	774	907
146A	1007	1173	1216
146B	1237	1046	1170
147A	1032	914	702
147B	837	927	651
148A	1213	1127	927
148B	1104	1012	1043
149A	Sample not tested - degraded during grafting		
149B	" " "	" "	"
150A	" " "	" "	"
150B	" " "	" "	"
151A	" " "	" "	"
151B	" " "	" "	"

Table 30

Tensile Strength After Thermal Sterilization in 40% KOH at 145°C in the Presence of a Silver Electrode

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	703	675	669
101B	810	669	675
102A	410	352	352
102B	375	282	375
103A	1560	1560	1560
103B	1560	1560	1390
104A	1526	2110	1878
104B	1543	1428	1621
105A	741	780	668
105B	700	696	696
106A	1530	1667	1667
106B	1719	1604	1667
107A	550	483	550
107B	550	550	550
108A	309	428	309
108B	309	396	412
109A	550	610	186
109B	172	550	550
110A	1217	927	1170
110B	1240	1262	1052

Table 30 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	196	141	141
111B	236	127	211
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	1002	857	879
113B	976	1145	1002
114A	690	580	530
114B	655	701	670
115A	282	164	334
115B	332	291	156
116A	1460	1105	1214
116B	1324	1145	934
117A	1260	1505	917
117B	1145	1145	881
118A	937	890	668
118B	801	986	712
119A	1077	973	1145
119B	842	1095	1145
120A	301	255	260
120B	286	309	286

Table 30 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	1245	1338	1428
121B	1428	1262	1409
122A	761	700	509
122B	700	509	450
123A	174	<50	174
123B	109	174	<50
124A	236	168	168
124B	168	157	202
125A	740	571	430
125B	666	687	444
126A	<50	<50	<50
126B	<50	140	<50
127A	388	267	267
127B	468	307	267
128A	540	629	551
128B	563	551	551
129A	206	500	198
129B	514	206	206
130A	771	592	628
130B	628	590	592

Table 30 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	927	716	824
132B	1015	643	917
133A	925	724	823
133B	813	777	865
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	924	1237	1236
136B	1123	1129	1123
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	721	1263	783
138B	754	717	647
139A	1171	842	916
139B	939	1212	771
140A	1106	1243	1213
140B	1124	1330	1127

Table 30 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	923	836	947
141B	1125	1329	925
142A	827	760	961
142B	829	1124	1207
143A	1123	1040	1120
143B	1241	939	927
144A	1236	1215	923
144B	1104	836	1123
145A	1172	851	695
145B	920	749	726
146A	1127	862	716
146B	823	849	927
147A	1241	936	723
147B	1213	771	875
148A	843	1123	1214
148B	869	936	1125
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 31

Tensile Strength After Thermal Sterilization in 40% KOH at 137°C

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	635	711	648
101B	645	720	920
102A	516	473	639
102B	456	427	510
103A	1272	1160	1370
103B	1056	1341	926
104A	1310	949	1123
104B	1873	1935	1635
105A	924	616	919
105B	742	677	842
106A	1635	1205	1671
106B	1543	1740	1727
107A	715	533	573
107B	632	619	645
108A	426	317	473
108B	525	481	523
109A	577	707	802
109B	616	554	623
110A	1122	923	1044
110B	1051	1222	811

Table 31 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	315	225	338
111B	180	202	145
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	846	1033	1174
113B	1218	935	1045
114A	839	544	720
114B	617	819	795
115A	135	273	300
115B	318	194	241
116A	1206	1310	1141
116B	1150	913	1006
117A	1245	1141	1263
117B	1040	937	1117
118A	823	991	836
118B	714	577	718
119A	1134	811	943
119B	1021	927	1010
120A	275	704	407
120B	533	312	415

Table 31 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	1131	1078	993
121B	1157	1040	1020
122A	703	816	717
122B	614	773	895
123A	215	185	212
123B	119	191	217
124A	248	287	233
124B	217	140	177
125A	720	779	650
125B	735	673	702
126A	186	203	122
126B	<50	115	195
127A	412	295	310
127B	361	270	345
128A	530	510	555
128B	490	517	483
129A	456	485	189
129B	319	362	290
130A	778	700	642
130B	645	733	655

Table 31 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	1134	1235	1181
132B	1313	952	1243
133A	916	935	840
133B	1014	833	916
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested -high resistance after sterilization		
135B	" " " " " " "		
136A	1035	1271	1142
136B	1134	1030	1234
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	837	1070	925
138B	945	916	840
139A	1122	1221	1293
139B	1205	1172	1091
140A	1018	1174	1143
140B	971	909	1126

Table 31 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	966	928	937
141B	824	772	724
142A	941	697	925
142B	926	918	938
143A	941	925	1126
143B	1127	877	1209
144A	946	925	929
144B	874	877	801
145A	921	1019	705
145B	930	832	814
146A	840	717	928
146B	723	773	816
147A	924	1033	1014
147B	1071	1093	1113
148A	790	900	853
148B	835	841	779
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 32

Tensile Strength After Thermal Sterilization in 40% KOH at 137°C in the Presence of a Silver Electrode

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
101A	940	835	817
101B	773	836	740
102A	412	390	340
102B	410	373	356
103A	1486	1519	1491
103B	1527	1502	1618
104A	1722	1205	1810
104B	1616	1794	1645
105A	716	687	716
105B	645	728	645
106A	1509	1635	1677
106B	1710	1641	1636
107A	501	518	593
107B	573	471	555
108A	413	716	734
108B	453	522	577
109A	782	610	575
109B	724	653	538
110A	1116	1023	1204
110B	914	1171	837

Table 32 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
111A	242	140	167
111B	138	216	211
112A	Sample not tested - high resistance		
112B	" " " " "		
113A	1141	1016	974
113B	1217	987	1230
114A	510	670	694
114B	702	511	526
115A	316	256	311
115B	286	298	309
116A	1410	1211	1146
116B	1429	1147	1015
117A	1410	1414	1265
117B	1273	1339	1101
118A	1212	910	1131
118B	747	1096	1003
119A	948	863	702
119B	917	848	817
120A	317	246	330
120B	281	280	338

Table 32 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
121A	1271	1222	1191
121B	1309	1498	1032
122A	715	832	658
122B	781	701	669
123A	<50	141	<50
123B	233	133	<50
124A	222	191	290
124B	189	256	277
125A	543	326	511
125B	478	402	420
126A	197	114	177
126B	123	222	114
127A	223	351	227
127B	313	320	198
128A	632	543	603
128B	570	619	578
129A	301	413	273
129B	326	310	221
130A	742	636	628
130B	778	650	667

Table 32 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
131A	Sample not tested - high resistance		
131B	" " " " "		
132A	937	820	742
132B	577	1023	768
133A	711	743	943
133B	819	712	808
134A	Sample not tested - high resistance		
134B	" " " " "		
135A	Sample not tested-high resistance after sterilization		
135B	" " " " " " "		
136A	835	790	811
136B	816	804	832
137A	Sample not tested - high resistance		
137B	" " " " "		
138A	1023	862	740
138B	917	733	907
139A	1008	1171	1214
139B	1032	1046	1017
140A	925	905	823
140B	925	911	719

Table 32 (Continued)

Sample	Ster. No. 1	Ster. No. 2	Ster. No. 3
141A	730	732	801
141B	847	919	945
142A	816	743	776
142B	790	738	758
143A	1010	1230	1046
143B	1137	1125	1173
144A	1215	1129	1007
144B	1163	775	1428
145A	936	1370	776
145B	921	835	943
146A	1123	1121	937
146B	1415	935	938
147A	976	940	743
147B	732	898	771
148A	1024	1045	1171
148B	970	1310	1027
149A	Sample not tested - degraded during grafting		
149B	" " "	" " "	
150A	" " "	" " "	
150B	" " "	" " "	
151A	" " "	" " "	
151B	" " "	" " "	

Table 33

In-Cell Performance - Radiation Precrosslinked Membranes

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	Cell Capacity(AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
101	1	1.07	1.02	1.01	0.88	0.88	0.88	84.8
	2	1.03	1.01	1.00	0.83	0.88	0.82	84.1
	3	1.03	1.03	1.01	0.84	0.84	0.79	81.3
	4	cells removed from test						
	5							
102	1	0.88	0.88	0.92	0.79	0.75	0.75	85.2
	2	0.91	0.88	0.88	0.76	0.74	0.67	81.8
	3	cells removed from test						
	4							
	5							
103	1	0.91	0.90	0.91	0.73	0.80	0.81	86.7
	2	0.92	0.91	0.90	0.77	0.78	0.80	85.8
	3	0.93	0.90	0.91	0.70	0.68	0.71	75.4
	4	0.92	0.91	0.91	0.61	0.69	0.60	69.3
	5	cells removed from test						
104	1	1.04	1.07	1.01	0.92	0.95	0.89	88.3
	2	1.01	1.07	1.03	0.89	0.92	0.88	86.7
	3	1.01	1.03	1.05	0.88	0.91	0.92	87.5
	4	1.00	1.01	1.03	0.89	0.91	0.92	89.0
	5	1.00	1.03	1.03	0.89	0.90	0.92	88.9
105	1	0.88	0.92	0.88	0.83	0.85	0.78	91.9
	2	0.84	0.88	0.88	0.58	0.75	0.63	76.5
	3	cells removed from test						
	4							
	5							
106	1	0.92	0.90	0.90	0.78	0.75	0.75	84.6
	2	0.92	0.92	0.90	0.75	0.67	0.58	74.6
	3	0.96	0.92	0.91	0.63	0.63	0.42	60.3
	4	cells removed from test						
	5							
107	1	1.08	1.04	1.09	1.03	1.05	1.08	98.5
	2	1.08	1.04	1.12	1.08	1.06	1.05	98.6
	3	1.07	1.04	1.13	1.08	1.06	1.05	98.6
	4	1.07	1.06	1.12	1.09	1.06	1.05	98.5
	5	1.07	1.06	1.13	1.09	1.06	1.06	98.5
108	1	0.89	0.91	0.88	0.80	0.74	0.79	86.7
	2	0.91	0.91	0.91	0.70	0.61	0.72	74.5
	3	cells removed from test						
	4							
	5							

Table 33 (Continued)

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	Cell Capacity (AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
109	1	0.88	0.83	0.83	0.78	0.75	0.79	89.4
	2	0.84	0.88	0.82	0.80	0.81	0.76	93.2
	3	0.88	0.83	0.83	0.75	0.83	0.74	90.7
	4	0.83	0.84	0.84	0.75	0.76	0.75	89.2
	5	0.84	0.83	0.88	0.81	0.79	0.76	93.0
110	1	1.13	1.12	1.08	1.12	1.07	1.11	99.0
	2	1.13	1.12	1.08	1.07	1.07	1.08	96.8
	3	1.11	1.09	1.09	1.08	1.08	1.05	97.9
	4	1.11	1.09	1.13	1.08	1.09	1.05	96.5
	5	1.13	1.13	1.11	1.07	1.08	1.09	96.5
111	1	0.86	0.90	0.87	0.75	0.78	0.75	86.7
	2	0.90	0.91	0.89	0.61	0.77	0.70	77.2
	3	cells removed from test						
	4							
	5							

NOTE: C = Control Cells

S = Sterilized Cells

Table 34

In-Cell Performance - DVB Precrosslinked Membranes

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	Cell Capacity (AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
113	1	1.15	1.17	1.14	1.04	1.02	1.02	89.2
	2	1.11	1.16	1.15	0.97	0.99	0.86	82.7
	3	1.12	1.16	1.14	0.99	0.96	0.86	82.3
	4	1.14	1.14	1.12	1.01	0.96	0.89	84.2
	5	1.13	1.14	1.13	1.00	0.96	0.91	84.4
114	1	1.10	1.09	1.07	0.94	0.96	0.97	88.4
	2	1.09	1.08	1.10	0.95	0.91	0.93	85.3
	3	1.09	1.10	1.04	0.98	0.91	0.94	87.7
	4	1.07	1.09	1.02	0.94	0.90	0.91	86.5
	5	1.04	1.07	1.03	0.92	0.91	0.89	86.6
115	1	1.05	1.02	1.05	0.79	0.88	0.89	82.0
	2	1.07	1.01	1.04	0.86	0.85	0.91	83.3
	3	1.07	1.04	1.08	0.84	0.81	0.94	81.3
	4	1.05	1.03	1.07	0.85	0.83	0.90	82.0
	5	1.03	1.04	1.07	0.82	0.84	0.91	81.6
116	1	1.13	1.17	1.14	1.14	1.14	1.11	98.6
	2	1.11	1.17	1.17	1.17	1.14	1.12	99.4
	3	1.12	1.14	1.13	1.17	1.13	1.13	100+
	4	1.13	1.14	1.14	1.09	1.11	1.12	97.4
	5	1.11	1.11	1.13	1.08	1.10	1.11	98.3
117	1	1.09	1.10	1.08	1.01	1.00	1.00	92.1
	2	1.10	1.10	1.10	1.02	1.00	0.98	90.9
	3	1.09	1.10	1.11	1.00	1.02	0.94	89.8
	4	1.08	1.08	1.10	0.96	0.96	0.96	88.5
	5	1.09	1.08	1.10	0.98	0.92	0.95	87.0
118	1	1.13	1.08	1.09	0.97	1.02	1.00	90.7
	2	1.10	1.07	1.10	0.94	1.00	1.02	90.5
	3	1.07	1.07	1.14	0.89	1.01	1.00	88.4
	4	1.07	1.05	1.08	0.89	0.96	1.00	89.0
	5	1.08	1.05	1.08	0.86	0.95	0.95	86.2

NOTE: C = Control Cells
S = Sterilized Cells

Table 34 (Continued)

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	Cell Capacity (AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
119	1	1.14	1.13	1.16	1.11	1.14	1.17	99.6
	2	1.11	1.17	1.15	1.09	1.13	1.12	97.4
	3	1.13	1.14	1.13	1.10	1.13	1.12	98.5
	4	1.11	1.14	1.17	1.09	1.11	1.12	97.1
	5	1.13	1.16	1.14	1.07	1.11	1.11	96.0
120	1	1.04	1.10	1.02	0.91	0.97	0.97	90.2
	2	1.07	1.04	1.04	0.82	0.92	0.91	83.2
	3	1.01	1.05	1.03	0.77	0.92	0.89	83.5
	4	1.02	1.05	1.04	0.79	0.91	0.88	80.7
	5	1.02	1.03	1.02	0.77	0.91	0.84	82.2
121	1	0.94	1.02	1.00	0.84	0.78	0.77	80.7
	2	0.96	1.00	1.02	0.89	0.82	0.84	85.6
	3	0.94	0.97	1.02	0.92	0.79	0.85	87.2
	4	0.91	0.94	1.03	0.90	0.78	0.82	86.8
	5	0.88	0.94	1.02	0.90	0.76	0.81	87.0

NOTE: C = Control Cells
S = Sterilized Cells

Table 35

In-Cell Performance - Membranes Radiation Postcrosslinked at Various Relative Humidity Levels

Sample No.	Cycle No.	Discharge Capacities of Sterilized and Control Cells C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
122	1	1.08	1.07	1.04	0.75	0.75	0.61	67.5
	2	1.05	1.07	1.04	0.75	0.75	0.42	59.2
	3	cells removed from test						
	4							
	5							
123	1	1.01	1.01	1.04	0.54	*	*	--
	2							
	3	*cells shorted during formation charge						
	4							
	5							
124	1	0.91	0.97	0.91	0.21	0.13	0.26	21.5
	2	cells removed from test						
	3							
	4							
	5							
125	1	1.04	1.07	1.07	1.00	1.02	1.00	94.9
	2	1.05	1.07	1.08	1.01	1.03	1.03	95.8
	3	1.05	1.08	1.08	1.03	*	*	
	4							
	5	*cells shorted during charge						
126	1	1.03	1.01	1.02	1.02	1.00	0.99	98.4
	2	1.04	1.01	1.06	1.02	1.01	0.94	95.8
	3				*	*	*	
	4	*cells shorted during charge						
	5							
127	1	1.00	0.94	1.00	0.97	0.95	0.95	97.4
	2	1.01	0.97	0.99	0.81	0.11	*	
	3	*cells shorted during charge						
	4	cells removed after second cycle						
	5							

Table 35 (Continued)

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
128	1	1.02	1.01	1.07	1.01	1.00	1.00	97.1
	2	1.04	1.05	1.10	1.02	*	1.01	
	3				*		*	
	4	*cells shorted during charge						
	5							
129	1	1.01	1.03	1.01	0.94	0.87	1.00	92.1
	2	1.03	1.03	1.02	0.21	0.89	0.73	59.3
	3	cells removed from test						
	4							
	5							
130	1	1.04	1.00	1.01	*	1.04	1.03	
	2					*	*	
	3	*cells shorted during charge						

NOTE: C = Control Cells
S = Sterilized Cells

Table 36

In-Cell Performance - DVB Postcrosslinked Membranes

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	Cell Capacity (AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
131	Sample not tested - high resistance							
132	1	1.13	1.03	1.14	0.81	0.84	0.88	76.8
	2	1.09	1.10	1.15	0.79	0.83	0.86	74.2
	3	1.11	1.12	1.09	0.80	0.81	0.90	75.8
	4	1.13	1.10	1.06	0.79	0.84	0.89	76.8
	5	1.12	1.08	1.07	0.76	0.81	0.89	75.2
133	1	1.17	1.10	1.06	0.81	0.90	0.91	78.7
	2	1.15	1.11	1.15	0.84	0.93	0.91	80.8
	3	1.16	1.12	1.09	0.80	0.91	0.86	76.4
	4	1.15	1.12	1.11	0.84	0.90	0.88	74.5
	5	1.15	1.10	1.10	0.83	0.98	0.88	77.8
134	Sample not tested - high resistance							
135	1	1.08	1.14	1.10	1.11	1.11	1.03	98.0
	2	1.10	1.09	1.10	0.83	1.00	0.96	84.8
	3	1.10	1.12	1.11	0.71	1.00	0.98	80.8
	4	1.09	1.10	1.09	0.92	0.91	0.88	82.7
	5	1.08	1.09	1.09	0.91	0.88	0.88	81.8
136	1	1.13	1.15	1.16	1.16	1.19	1.17	100+
	2	1.11	1.14	1.16	1.06	1.17	1.13	98.5
	3	1.11	1.12	1.15	1.09	1.13	1.16	100+
	4	1.12	1.13	1.14	1.05	1.09	1.10	95.6
	5	1.11	1.12	1.14	1.08	1.08	1.09	96.5
137	Sample not tested - high resistance							
138	1	1.04	1.05	1.04	0.96	1.00	0.92	92.1
	2	1.05	1.06	1.07	0.89	0.94	0.93	87.0
	3	1.07	1.07	1.03	0.82	0.84	0.89	80.4
	4	1.07	1.10	1.04	0.85	0.88	0.86	80.6
	5	1.05	1.08	1.02	0.84	0.88	0.87	82.2

Table 36 (Continued)

In-Cell Performance - DVB Postcrosslinked Membranes

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	Cell Capacity (AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
139	1	1.12	1.14	1.15	1.04	1.04	1.07	92.4
	2	1.12	1.10	1.14	1.01	1.04	1.01	91.0
	3	1.11	1.11	1.14	1.02	1.03	1.04	92.0
	4	1.10	1.14	1.11	1.05	1.03	1.05	93.3
	5	1.09	1.12	1.10	1.03	1.02	1.05	93.4

NOTE: C = Control Cells
S = Sterilized Cells

Table 37

In-Cell Performance - Membranes Simultaneously Grafted with Acrylic Acid and DVB

Discharge Capacities of Sterilized and Control Cells

Sample No.	Cycle No.	Cell Capacity (AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
140	Sample not tested - high resistance							
141	1	1.04	1.08	1.07	0.84	0.79	0.94	80.6
	2	1.07	1.08	1.08	0.79	0.74	0.92	75.9
	3				*		*	
	4	*shorted on charge						
	5							
142	1	1.07	1.10	1.08	0.96	1.00	0.83	85.9
	2	1.08	1.08	1.04	0.50	0.96	0.58	63.7
	3				*			
	4	*shorted on charge						
	5							
143	1	1.10	1.08	1.11	1.03	1.08	1.03	95.4
	2	1.05	1.07	1.11	1.04	1.13	1.08	100+
	3	1.07	1.10	1.08	1.04	1.11	1.04	95.2
	4	1.17	1.08	1.07	1.04	1.11	1.05	96.2
	5	1.13	1.08	1.10	1.05	1.09	1.04	96.0
144	Sample not tested - high resistance							
145	1	1.04	1.02	1.08	0.97	1.02	1.00	95.4
	2	1.04	1.04	1.10	0.96	1.00	0.95	91.4
	3	1.03	1.04	1.08	0.89	1.00	0.88	87.8
	4	1.04	1.01	1.09	0.91	0.95	0.90	87.2
	5	1.01	1.04	1.10	0.84	0.96	0.86	85.1
146	1	1.09	1.07	1.11	1.04	1.01	1.02	93.8
	2	1.05	1.08	1.08	0.96	1.02	0.95	91.4
	3	1.04	1.07	1.07	0.96	0.96	0.92	89.3
	4	1.04	1.05	1.07	0.92	0.96	0.94	89.2
	5	1.05	1.05	1.07	0.92	0.95	0.92	88.3

Table 37 (Continued)

Discharge Capacities of Sterilized and Control Cells

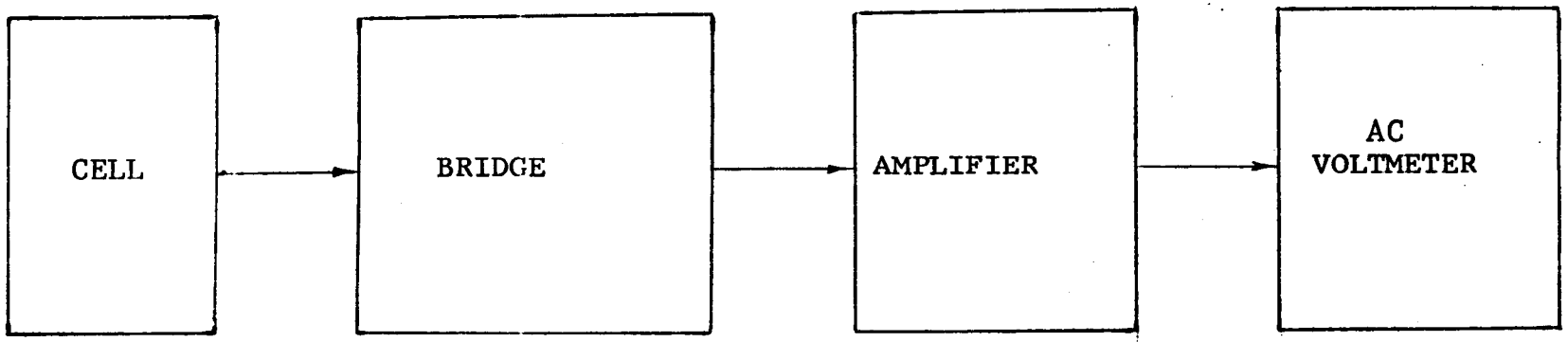
Sample No.	Cycle No.	Cell Capacity (AH) C1	C2	C3	S1	S2	S3	Capacity Retention of Sterilized Cells Relative to Controls (%)
147	1	1.10	1.13	1.12	1.00	0.97	1.00	91.4
	2	1.08	1.11	1.08	0.96	0.92	0.95	86.5
	3	1.07	1.10	1.09	0.93	0.92	0.96	86.0
	4	1.04	1.10	1.07	0.95	0.91	0.88	85.4
	5	1.04	1.08	1.07	0.92	0.92	0.90	86.2
148	1	1.13	1.09	1.10	1.04	1.02	1.02	92.7
	2	1.10	1.08	1.08	0.63	0.96	0.92	77.0
	3	1.09	1.07	1.08	0.38	0.38	0.88	50.7
	4	Cells removed from test						
	5							

NOTE: C = Control Cells
S = Sterilized Cells

Table 38

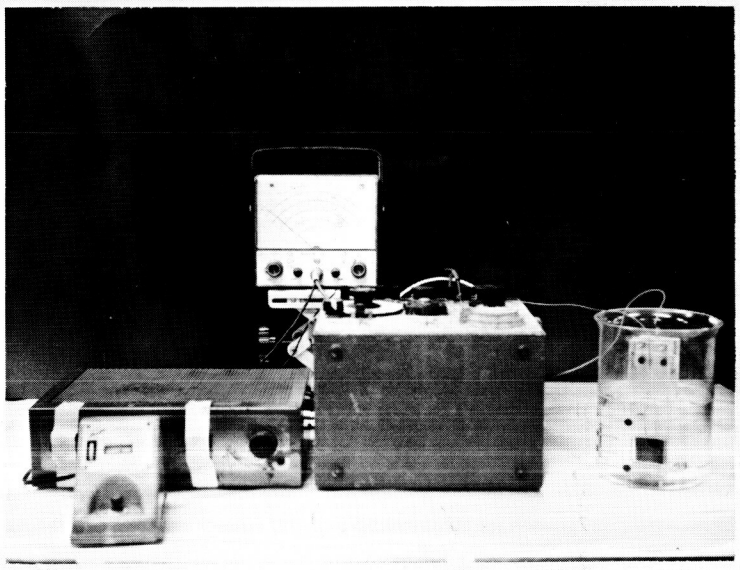
Suppliers of Materials for Fabrication of Samples

Material			Supplier
Polyethylene Film 0.9 mil thick 13 inches wide	Density 0.917 0.938 0.960	Resin Marlex 1712 Marlex 101 Marlex 6003	Phillips Petroleums New York, N.Y.
Benzene 1% Nitration Grade			Peerless Oil and Chemical Co. Long Island City, N.Y.
Glacial Acrylic Acid			Rohm & Haas Philadelphia, Pa.
Carbon Tetrachloride Reagent Grade Cat. No. C-187			Fisher Scientific Company Fairlawn, N.J.
Divinylbenzene Cat. No. DX 2403			Metro Scientific Inc. Carle Place, Long Island, N.Y.
Methanol Purified Cat. No. A-411			Fisher Scientific Company Fairlawn, N.J.



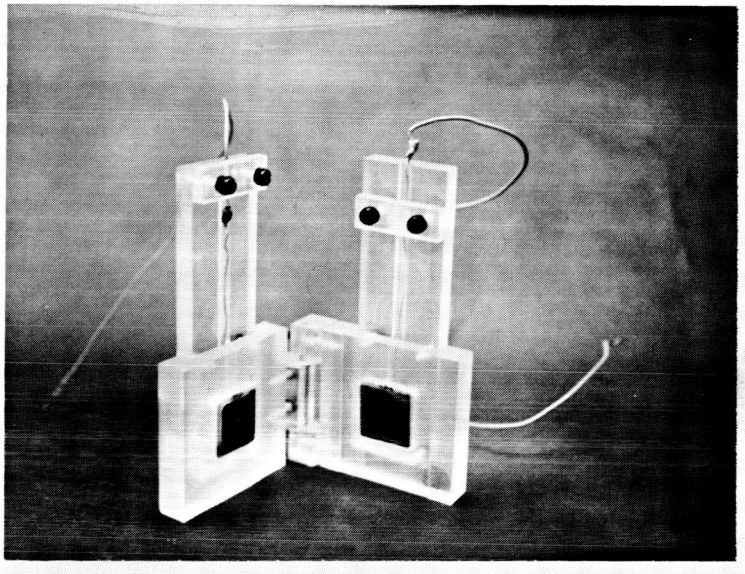
Resistance Measurement Circuit

Figure 1



Resistance Measurement Apparatus

Figure 2



Resistance Cell in Open Position

Figure 3

Sterilization Chambers

Figure 4

In-Cell Test Setup

Figure 5