THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

INCORPORATED

CALL FOR PAPERS

1967 IEEE ANNUAL CONFERENCE

NUCLEAR AND SPACE RADIATION EFFECTS

JULY 10-14, 1967 — COLUMBUS, OHIO

SPONSORED BY THE IEEE/G-NS RADIATION EFFECTS COMMITTEE AND IN COOPERATION WITH THE OHIO STATE UNIVERSITY DEPARTMENT OF ELECTRICAL ENGINEERING AND THE INTERDISCIPLINARY NUCLEAR ENGINEERING PROGRAM

SCOPE A special technical conference on nuclear and space radiation effects will be held on the campus of the Ohio State University in Columbus, Ohio. The sessions will cover the broad areas of theoretical and experimental nuclear and space radiation effects on materials, components, circuits and systems. These include investigation of the electrical and mechanical properties of irradiated solids, and displacement and ionization effects in electronic parts (microcircuits, FETs, junction transistors and diodes, capacitors, etc.). Other general topics will be combined environments, dosimetry, large dose effects, and methods of evaluating, predicting, and presenting radiation effects data. Papers are now being solicited for these areas.

PROGRAM The program will consist of about eight sessions of contributed papers and round table discussions, plus a symposium session which will consist of two invited papers delivered by recognized authorities in the field of radiation effects. The conference will be unclassified from a security standpoint and the authors will be responsible for obtaining all necessary clearances.

PROCEDURE Authors must submit a reproducible copy of a 500-word (minimum) summary, which should include technical results and pertinent examples of data with an interpretation of the significance of the work. The submission must include the names of the authors (indicating who will make the presentation), company affiliation, mailing address and IEEE membership status. The summary must be forwarded by March 1, 1967, to the 1967 Papers Chairman:

Dr. John L. Wirth
Organization 5212
Sandia Corporation
Sandia Base
Albuquerque, New Mexico

All summaries will be screened and those that are accepted will be presented at the conference. Acceptance of a conference paper also constitutes acceptance for publication in the conference issue of the IEEE Transactions on Nuclear Science, subject to editorial review. It is not necessary to be an IEEE member to present a paper.

Registration forms, programs, and additional information on the conference will be distributed in May 1967.

Conference Chairman:

Mr. S. E. Harrison
Mail Number 717
Radiation Physics Section
Martin Company
Baltimore, Maryland 21203

Publicity Chairman:

Mr. A. L. Long
Advanced Development Department
Central Laboratory G304
Burroughs Corporation
Paoli, Pennsylvania 19301

30 September 1966

Progress Report on JPL Contract

950783

Systematic Description of Bacterial Isolants

from Rigorous Environments

W. B. Bollen
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Ammonification and Nitrification in Desert Soils

This is a partial report on these soils. Completion awaits results of experiments on sulfur oxidation and soil respiration now in progress. A final report will be made in about three weeks.

This work was performed for the Jet Propulsion Laboratory, California Institute of Technology, sponsored by the National Aeronautics and Space Administration under Contract NAS7-100.

Ammonification and Nitrification in Desert Soils

from Jet Propulsion Laboratory

Ammonification. Table 1.

Ammonium liberated by hydrolysis and oxidation-reduction of added peptone after three days and five days incubation is used as an index of ammonifying power. All the soils except No. 68-3 were active in this heterotraphic function, being comparable to representative agricultural soils.

In No. 68-3 ammonium production increased slowly from three to five days. In No.'s 9-2 and 26 it also increased at five days. In No.'s 196 and 51-3 it decreased while No. 76-2 showed no change. Decreases after three days indicate that either assimilation or nitrification of ammonium is proceeding rapidly: the low concentrations of nitrate found show that assimilation was probably the contributing factor.

The accumulation of nitrite nitrogen in No. 68-3 was unusually high. In this case the accumulation cannot be attributed to high pH or to free ammonia because pH was near neutrality and ammonification was very low. Apparently some unusual feature of the microflora is involved.

Nitrification. Table 2

On incubation with ammonium sulfate for 30 days, only soils No. 76-2 and No. 51-3 showed a nitrifying power comparable to representative cultivated soils. Nitrification in No's 196, and 25 was essentially nil. Soil No. 1-2 showed practically the same production of nitrate in the control as with added ammonium, the net nitrification being only 1%. The pH values in all cases would favor nitrification. Soils 196, 68-3, 9-2, and 20 apparently lack nitrifying bacteria.

Soil No. 51-3 is of especial interest because the nitrification, while great, was due almost entirely to production of nitrite. This indicates the absence of *Nitrobacter*, which are responsible for the oxidation of nitrite to nitrate. While this condition is rarely encountered it is known to occur, particularly in certain Texas soils. Free ammonia will inhibit the second stage of nitrification, but in view of the pH value less than 8, this factor may be eliminated. Rather than over-all nitrification it is evident that only nitrosofication was extensive in soil No. 51-3.

Table 1 Ammonification in Desert Soils from Jet Propulsion Laboratory

Treatment	pH		Nitrogen NH_4^+		Nitrogen NO_2^-		Nitrogen NO_3^-		Nitrogen Total		Increase in Total over control		Ammonification	
	3 days	5 days	3 days ppm	5 days ppm	3 days ppm	5 days ppm	3 days ppm	5 days ppm	3 days ppm	5 days ppm	3 days ppm	5 days ppm	3 days %	5 days %
Soil No. 196 Control	8.9	8.9	14	20	0.10	0.10	4	6	18	26	-	-	-	-
Peptone @ 1000 ppm N	8.1	8.7	531	377	0.15	0.25	7	3	538	380	520	354	52	35
Soil No. 76-2 Control	8.4	8.6	21	20	0.80	1.60	8	8	30	30	-	-	-	-
Peptone @ 1000 ppm N	8.3	8.9	503	511	0.10	0.35	10	1	513	512	483	482	48	48
Soil No. 51-3 Control	8.4	8.8	17	15	0.40	0.50	12	10	29	26	-	-	-	-
Peptone @ 1000 ppm N	8.3	8.8	643	414	0.10	0.10	8	2	651	416	622	390	62	39
Soil No. 68-3 Control	8.4	8.4	16	15	0.35	0.60	41	45	57	61	-	-	-	-
Peptone @ 1000 ppm N	7.8	8.1	65	81	18.75	8.80	5	31	89	121	32	60	3	6
Soil No. 9-2 Control	6.5	6.6	31	30	0.80	1.25	15	14	47	45	-	-	-	-
Peptone @ 1000 ppm N	8.5	8.8	635	775	0.10	0.40	7	3	642	778	595	733	60	73
Soil No. 20 Control	6.9	6.8	32	20	0.10	0.10	5	3	37	23	-	-	-	-
Peptone @ 1000 ppm N	7.9	8.6	465	494	0.10	0.10	6	3	471	497	434	474	43	47

*Incubated 3 days and 5 days at 28° C with moisture adjusted to 50% of water-holding capacity.

Table 2

Nitrification in Desert Soils From Jet Propulstion Laboratory*

Treatment	pH	Nitrogen NO_2 ppm	NO_3 ppm	Total ppm	Nitrification %
Soil No. 196					
Control	8.9	0.00	4	4	
$(NH_4)_2SO_4$ @ 200 ppm N	8.2	0.31	2	2	0
Soil No. 76-2					
Control	8.5	0.00	14	14	
$(NH_4)_2SO_4$ @ 200 ppm N	7.4	0.20	84	84	35
Soil No. 51-3					
Control	8.7	0.25	13	13	
$(NH_4)_2SO_4$ @ 200 ppm N	7.9	100.00	6	106	47
Soil No. 68-3					
Control	8.3	3.36	55	58	
$(NH_4)_2SO_4$ @ 200 ppm N	8.3	1.10	60	61	2
Soil No. 9-2					
Control	6.1	0.20	35	35	
$(NH_4)_2SO_4$ @ 200 ppm N	5.6	0.35	36	36	1
Soil No. 20					
Control	6.7	0.00	0	0	
$(NH_4)_2SO_4$ @ 200 ppm N	6.6	0.00	1	1	1

*Incubated 30 days at 28° C with moisture adjusted to 50% of water-holding capacity.