2000 NASA Aerospace Battery Workshop

Recent Developments in Silver/Zinc Rechargeable Cell Studies

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For design performance analysis.

Eight cycle life and five wet life. Periodic cell removal.

Experimental – Five cell sets of thirteen cells each.

Objective – Reduce number of layers of separation on cathode while maintaining cell performance.

Casing model cell studies.

Introduction – History of cellphone and sausage.

Recent developments in silver/zinc.
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Results and Discussion

Silver migration comparisons
Discharge capacity comparisons
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Ampere-hours vs. cycles for different configurations.

Cycle life data shows approx. equivalent performance.

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Flawed, comparison is shorted, so C19 cells none of the month, while the tenth shorted out by wet life cells the clear Flexel All but one of...
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Wrap advantage for split performance show a significant cycle life data.
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Set 1, overall, actually superior to Sets 2 and 13 were performance adequately. Not reflect the actual capacity averages do all, so the discharge Sets 2 and 13 shorted at months, while no cells in out beginning at the 6th.

The Set 1 cells shorted

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In any set, shorts occurred vs. C19; but no lowered capacity exhibited slightly configurations the two SC Cycle life data for Rechargeable Cell Studies Recent Developments in Silver/Zinc
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Life data, as well as C19 layer SC performed indicate that single-layer data.
Cellulophane vs. silver-treated identical for clear cycle life cells was silver migration in

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C19 cells much lower rate for life cells occurred at a silver migration in wet.

Sel 2 - Silver-Treated YTF Cellogaphene
Sel 1 - Untreated YTF Cellogaphene

Flexel Clear x6 vs. YTF C-19x6 w4 55% KOH
Separation Composition Study - Wet Life

Months vs Sel 1 - Ag
Months vs Sel 2 - Ag
Silver Migration: Similar to standard wrap in split wrap.

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Cycle Life.

YTP C-19 Standard vs. Split Wrap w 45% KOH
Separation Composition Study Cycle Life

Set 13 - Split Wrap, 3 layers each on anode and cathode
Set 2 - Standard Wrap, 6 layers on cathode
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Sc sets was trapped at the PVA layer. The silver in both SC & layer-by-layer C19 migration rate than much higher silver layer cells have a that the single SC.

Although it appears

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PVA film was stopped by the silver in the SC cells show that all the layer-by-layer data here also the cycle life.

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Cellulose vs. Sausage Casing
Split Wrap vs. "Standard" Wrap
Clear vs. Silver-Treated Cellulose
Conclusions

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6-mill fiber-reinforced SC tubular
1-mill (tubular) SC/1-mill PVA film/2.3-mill plain or
Film in the following configuration:
Strongly consider use of sausage casing with PVA
Use split wrap for cellulophane whenever possible
Cellulophane
Use silver-treated cellulophane instead of clear
Recommendations

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