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Separator for Alkaline Batteries

A number of separator compositions have been tested as components of three-plate silver-zinc oxide cells in a standard cycling test. The compositions were in the form of either thin films or envelopes into which the electrodes could be fitted. The electrical cycling was designed to serve as a screening test enabling superior materials to be chosen for more intensive examination. Six such materials meet the imposed requirements, giving cycling performance superior to cellophane. An arbitrary end point was set at 10 cycles, and those cells completing 10 cycles are considered candidates for further and more extensive testing in full cells.

The only commercial separators for alkaline silver cells have been of cellulosic origin, with films of unplasticized cellophane giving the best and most reliable performance characteristics. Unmodified cellulose are not stable in the battery environment. Both hydrolysis by the electrolyte and oxidation byproducts of the electrode/electrolyte reactions cause degradation and loss of barrier properties. Many attempts have been made to modify cellulose films to increase their useful lifetime in the system, but none have resulted in improvements of the desired magnitude.

Recently, however, several films developed in separator investigation programs have been found to

have greater resistance to oxidation by silver oxide and to zinc penetration than unmodified cellulose. Battery test data on these materials verified the improvement in stability, and cycle life was obtained greater than with similar cells using cellophane. Sample films that were screen tested were first characterized in a bench-screening test program. Measurements were made of electrical resistance before and after cell testing and of the performance of three-plate cells using the films.

Note:

Documentation for the invention is available from:
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Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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