

## SEPARATOR FOR ALKALINE BATTERIES

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The objective of this project is to develop and demonstrate a new alkaline battery separator membrane based on a combination of a heat and oxidation resistant polymer, such as polyphenylquinoxaline (PPQ), and cellulose acetate (CA).

During the calendar year 1978, studies were conducted on fabrication techniques, electrical resistivity, hydroxyl ion diffusion, and resistance to oxidation of these membranes. The results of these studies have been favorable and indicate that a separator of this type is feasible. The fabrication procedure will require further work since it has only been demonstrated by casting on a glass plate followed by precipitation.

During the first half of 1979, we performed experiments on zinc diffusion, zinc penetration, and pore size determination on PPQ/CA membranes. Cycle life testing is currently under investigation and preliminary results indicate that the new separator provides an 18 - 20% improvement in cycle life.

The plans and objectives for the remainder of 1979 and for 1980 call for the continuation of additional cycle life experiments coupled with improved methods of fabrication using a possible sandwich type configuration. Any major technical problems that may be encountered will occur when small semicontinuous pilot plant operations are initiated. Any problems that may arise as a result of this operation, however, will be solved provided that this effort continues to be funded.

### Recent publications

- 1 I. A. Angres, W. P. Kilroy and J. V. Duffy, Battery separators from polyphenylquinoxaline polymer blends, *Proc. 28th Power Sources Conf., Atlantic City, NJ, 1978, p. 162.* Published by the Electrochemical Society.
- 2 I. A. Angres, Battery separators from polyphenylquinoxaline polymer blends, *NSWC/WOL TR 78-56.*
- 3 I. A. Angres, Pore size determination of PPQ/CA separators, *NSWC/WOL TR 79-291.*
- 4 I. A. Angres, Heat and chemically resistant polymeric membranes, *28th Power Sources Conf., Atlantic City, NJ, June 1978, Secondary Battery Session.*