

SYNTHESIS AND CHARACTERIZATION OF IMPROVED ION SELECTIVE SEMIPERMEABLE ANION EXCHANGE MEMBRANES

Ionics, Inc., 65 Grove Street, Watertown, MA 02172 (U.S.A.)

The objective of this contract is the manufacture and evaluation of improved anion selective membranes suitable for use in the electrochemical Redox Energy Storage System.

Of the membrane systems investigated, the two most suitable are the CD1L and CP4L systems. These membranes are easy to manufacture in large quantities and the cost is low. More research is presently being done on lowering membrane resistivity by slightly varying some of the chemical components. The long range goals are to reduce resistivity and still maintain good selectivity and durability. Also, a low level search will continue for improved membrane systems.

The current best membranes have area resistivities of 3 ohm cm² when measured in 2N HCl and 5 ohm cm² when measured in redox cells.

Recent publications

- 1 S. S. Alexander and R. B. Hodgdon, Anion permselective membrane, *Ionics, Incorporated, NASA Contract Rep. No. CR-135316, January, 1978.*

ADVANCED SCREENING OF REDOX ELECTROCATALYSTS AND ELECTROLYTE MODIFICATIONS

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Task I — Characterization and improvement of the gold-lead electrodes including optimizing operating conditions such as current density, potential cut-off, etc. Further optimization of the gold-lead electrode will emphasize co-deposition of intermetallic phases and activation of the carbon or graphite felt substrate. Cycle life testing of a number of promising candidate preparations including carbon and/or graphite substrates will be done.

Task II — Investigation of catalysts other than gold-lead mixtures for reversibility of the Cr³⁺/Cr²⁺ reaction, hydrogen overvoltage and corrosion