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Through Batteries; References; Further Reading; Chapter 7 - Commercial Membrane Types; 7.1 Unreinforced Perfluorinated Sulfonic Acid Films; 7.2 Reinforced Perfluorinated Membranes; References; Chapter 8 - Economic Aspects; 8.1 Chlor-Alkali Cells; 8.2 Fuel Cells; References; Chapter 9 - Experimental Methods; 9.1 Infrared Spectra; 9.2 Hydrolysis, Surface Hydrolysis, and Staining; 9.3 Other Reactions of the Precursor Polymer; 9.4 Ion Exchange Equilibrium 9.5 Determination of EW by Titration or Infrared Analysis 9.6 Determining Melt Flow; 9.7 Distinguishing the Precursor Polymer from Various Ionic Forms; 9.8 Fenton's Test for Oxidative Stability; 9.9 Examination of a Membrane; 9.10 Determining the Permselectivity; 9.11 Measuring Pervaporation Rates; 9.12 Simple Electrolytic Cells; References; Chapter 10 - Heat Sealing and Repair; Reference; Chapter 11 - Handling, Storage, and Installation; 11.1 Handling the Film; 11.2 Pretreatment; 11.3 Installation; 11.4 Sealing and Gasketing; References; Chapter 12 - Toxicology, Safety, and Disposal 12.1 Toxicology 12.2 Safety; 12.3 Disposal; References; Appendix A: A Chromic Acid Regeneration System; Appendix B: Laboratory Chlor-alkali Cell; Appendix C: Solution Cast Nafion Film; DuPont™ Nafion® PFSA Membranes NRE-211 and NRE-212 (Perfluorosulfonic Acid Polymer); Appendix D: Plastic-Based Bipolar Plates; Bipolar and Monopolar Plate Standard Properties of Entegris; DuPont™ Nafion® membranes: Membranes for Fuel Cells; XL-100 Membrane; Properties of Nafion® PFSA Membrane; Order and Packaging Information; Separating XL Membrane from the Coversheet and Backing Film; Product Labeling Recommended Roll Storage Conditions

Sommario/riassunto

Fluorinated ionomer polymers form impermeable membranes that conduct electricity, properties that have been put to use in large-scale electrochemical applications, revolutionizing the chlor-alkali industry and transforming production methods of some of the world's highest-production commodity chemicals: chlorine, sodium hydroxide and potassium hydroxide. The use of fluorinated ionomers such as Nafion® have removed the need for mercury and asbestos in these processes and led to a massive reduction in electricity usage in these highly energy-intensive processes. Polymers in this group have al
