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COPOLYMERIZATION OF FLUORINATED ACRYLIC MONOMERS AND SODIUM-p-STYRENE SULFONATE

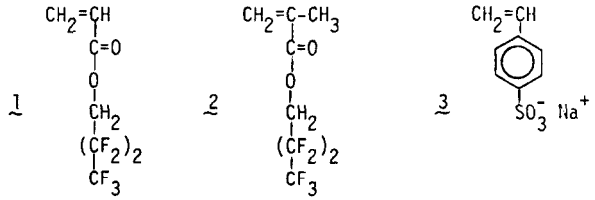
I. Yilgör, E. Yilgör and J. E. McGrath

Department of Chemistry, Polymer Materials and Interfaces Laboratory, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061 (U.S.A.)

R. D. Lundberg

Corporate Research Science Laboratories, Exxon Research and Engineering Co., P.O. Box 45, Linden, New Jersey 07036 (U.S.A.)

Fluorinated, acrylic vinyl monomers such as; 1H,1H-Heptafluorobutyl acrylate 1, and 1H,1H-Heptafluorobutyl methacrylate 2, were copolymerized with sodium-p-styrene sulfonate 3, via emulsion polymerization.



The polymerization reactions were carried out at 70-75°C, for 4.5-5 hours using a water soluble initiator, a nonionic surfactant and a hydrocarbon soluble chain transfer agent. The level of ion-containing monomer was varied between 0-7 mole percent. The copolymers were obtained in high yield and high molecular weight. They showed novel ionomeric behavior as characterized by FTIR, penetration studies, stress-strain tests and DSC.

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SYNTHESIS AND CHARACTERIZATION OF PERFLUOROCARBOXYLATE POLYMERS

Haruhisa Miyake* and Masaaki Yamabe

Research & Development Division, Asahi Glass Co., Ltd., Hazawa-cho, Kanagawa-ku, Yokohama 221 (Japan)

Perfluorocarboxylated polymers have recently become increasingly important as base material for ion exchange membranes with excellent electrolytic performance in chlor-alkali process. The polymers were synthesized by copolymerization of tetrafluoroethylene and functional perfluorovinylether such as $CF_2=CFO(CF_2)_3COOCH_3$ and $CF_2=CFOCF_2CF(CF_3)O-(CF_2)_3COOCH_3$. Copolymerization was conducted in bulk or solution system in trichlorotrifluoroethane with the use of radical initiator including azobisisobutyronitrile. By controlling monomer feed ratio, copolymers having various vinylether contents up to 35 mole% were obtained. Reactivity ratios of tetrafluoroethylene and perfluorovinylethers were 7.00 and 0.14, respectively. Resulting copolymers were partially crystalline or amorphous depending upon vinylether contents. The copolymers had thermal decomposition temperature as high as 320°C and melt viscosity of c.a. 10^4 poise at 200 ~ 230°C. Characterization of these new copolymers are reported based on the measurement of I.R, NMR, Xray spectra and viscoelastic behavior.