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Preparation and Electrochemical Properties of Polyethylene Membrane Modified with the Sulfonic Acid Groups for Battery Separator

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Abstract

Ion-exchange membrane modified with the sulfonic acid group for battery separator was prepared by radiation-induced grafting of styrene (St) onto polyethylene (PE) film and subsequent sulfonation of poly(St) graft chains.

The surface area, thickness, and volume of grafted film increased with increase in grafting yield. The water uptake and KOH diffusion flux of ion-exchange membrane increased with increase in the sulfonic acid content. Electrical resistance of ion-exchange membrane modified with the sulfonic acid group decreased with increase in the sulfonic acid content. The transport number (t_+) of K^+ in the sulfonated membrane was in the range of 0.91 – 0.96.