

Synthesis of Sorption-Active Polypropylene Fabric Bearing Sulfonic Acid Functional Groups

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Sorption-active materials based on polypropylene fabrics and fibers are widely used because of their low cost; oxidative, chemical and mechanical resistance, and highly developed specific surface.

Cation-exchange material carrying sulfonic acid groups was synthesized by radiation-induced graft polymerization of styrene monomer onto polypropylene nonwoven fabric with subsequent sulfonation of grafted polystyrene chains. The effect of the main experimental parameters on styrene grafting degree (absorbed dose, monomer concentration, reaction time and temperature, and additives) was investigated. Sulfonation of polystyrene chains grafted onto polypropylene fabric was carried out with 5% chlorosulfonic acid in dichloromethane at room temperature. The main peculiarities of the sulfonation reaction (influence of pre-treatment, duration of sulfonation and hydrolization) were investigated in details.

Cation-exchange polypropylene fabrics with sulfonic acid group densities of 3.5 -5 meq/g were obtained.