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SYNTHESIS OF ANION-EXCHANGE ADSORBENT BY AMINATION OF ACRYLIC ACID GRAFTED POLYPROPYLENE NONWOVEN FIBER FOR ANCHORING IONS

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The design and development of sorption-active natural and synthetic fibers and textile materials is of great scientific and practical interest .the advantages of that type of polymeric adsorbents, such as their developed specific surface, excellent ion-exchange parameters and ease of use especially under continuouse conditions, allow them to find great application in the chemical, biomedical, ecological and industrial fields. In recent years, graft polymerization has been widely used to develop adsorbents with various functional groups, high efficiency and ion selective properties. Many methods such as photo irradiation, ? ray irradiation and plasma discharging graftings are available. Among these methods plasma-induced graft polymerization is expected to be the most convenient method because the grafting location can be restricted to the surface of the polymer matrix without affecting any bulk properties. anion-exchange adsorbent on polypropylene nonwoven fibers was synthesized by plasma-induced graft polymerization of acrylic acid (AA) onto polypropylene (PP) nonwoven fibers and subsequent conversion of carboxyl group in grafted AA to an amine (Am) group by reaction with diethylene triamine (DETA) .Catalytic effect of metal chlorides such as AlCl? on the amination of grafted AA was significant but not essential to lead the amination. The anion-exchange capacity of PP-g-AA-Am fiber increased with increase in the degree of amination. the structural changes on the PP-g-AA-Am nonwoven fibers were analyzed by using FTIR and the morphologies of the fibers obtained by SEM .The modified fibers showed sufficient hydrophilicity to adsorb the anions from the aqueous solutions .furthermore the PP-g-AA-Am fiber also has adsorption ability for cations because of unaminated residual carboxyl group. it is believed to have advantage that simultaneous removal of ionic substances such as nitrogen , phosphorus , heavy metals, etc. nowadays the most widely advantages of this technique are the recovery of ions dissolved in water systems.