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Synthesis and Properties of Poly(Organophosphazenes) Electrolyte

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SYNTHESIS AND PROPERTIES OF POLY(ORGANOPHOSPHAZENES) ELECTROLYTE

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To prepare electrolytes using poly(organophosphazenes), poly(bisanilinophosphazene) selected was carried out with the various concentration of sulfonic chloride in tetrachloroethane solvent using vigorously stirring at room temperature for 4 hr. The products prepared were determined with IR and chemical analysis. It was found that the $-\text{SO}_3\text{H}$ groups in the product appeared at $1,1050\text{ cm}^{-1}$, $1,030\text{ cm}^{-1}$ and 550 cm^{-1} , and the reaction rate of sulfonic chloride was about 34%-55% under this experimental conditions. Also, the products had two kind of glass transition temperatures such as 63°C and -18°C , respectively, and the values were lower in comparison with that of starting polymer. Furthermore, the conductivity of the product at room temperature was determined and the conductivity was increased the concentration of $-\text{SO}_3\text{H}$ groups. It was found that the product having $-\text{SO}_3\text{H}$ groups was able to ion exchange with Li^+ or Cu^{2+} ions under aqueous solution. Also, the ion exchange rate was determined with the titration of alkaline aqueous solution with a standard solution of HCl . The products formed after the ion exchange reaction had higher conductivity in comparison with that of the polymer.