

Spectroscopic Characterization and Preparation of the Reactive Solid Polymer Membranes for Diene Separation

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Polymer-silver salt complexes were made by dissolving a silver salt, silver triflate (AgCF_3SO_3), silver perchlorate (AgClO_4) or silver tetrafluoroborate (AgBF_4), to a polymer solvent, POZ (Poly(2-ethyl-2-oxazoline)), PVP (Poly(vinylpyrrolidone)), CAB (cellulose acetate butyrate) and CA (cellulose acetate). The maximum selectivity for diene in AgBF_4 -CA membrane was found to be ca. 90 for isoprene/n-pentane mixture. Solid state interactions of AgBF_4 with CA and/or olefins have been investigated using FT-IR. FT-IR study clearly shows that the silver ions are coordinated by carbonyl oxygen groups. Treatment of the CA- AgBF_4 membrane placed in a specially designated cell with isoprene produces an isoprene-coordinated membrane in which coordinated olefin is easily replaced by other olefin such as propylene.