



## Mixed matrix membranes for pervaporative separation of isopropanol/water mixtures

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### ABSTRACT

Flat mixed matrix membranes (MMMs) were fabricated. Polyimides of Matrimid 5218 and P84 s backbone and different fillers including silica aerosil 200, zeolite 4A, and carbon molecular sieves were used. Effects of different polymer types and concentrations, and different filler types and contents up to 15 wt.% were studied. Scanning electron microscopy analysis showed acceptable connections between the two phases in addition to a confirmation may be concluded by higher MMMs pervaporation (PV) performances compared to those of neat polymeric membranes. Effective thermal treatment method was used to remove probable MMMs defects. Performed PV experiments showed better separation performances of MMMs with respect to those of neat polymeric membranes. The best results were obtained for hydrophile zeolite 4A filler where its incorporation improved both the filled matrices separation performance especially for Matrimid 5218 (10-wt.%)–zeolite 4A (10 wt.%) up to eight times while its permeation rate nearly increased by ~35%.

*Keywords:* Pervaporation; Mixed matrix membranes; Isopropanol/water separation

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