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# Enhanced $C_3H_6/C_3H_8$ separation performance in poly(vinyl acetate) membrane blended with ZIF-8 nanocrystals

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## Abstract

The implementation of membrane-based separation for olefin/paraffin mixtures has the potential to significantly reduce energy consumption, but is limited by the lack of suitable membrane materials with desired performance and low cost. Here, mixed matrix membranes (MMMs) fabricated from incorporating ZIF-8 nanocrystals into the poly(vinyl acetate) (PVAc) matrix exhibit significant improvement of propylene/propane permeability and selectivity as well as the operating stability. On the 39 wt% ZIF-8/PVAc MMMs, both the  $C_3H_6$  permeability and  $C_3H_6/C_3H_8$  selectivity are about 10-fold increase over pure PVAc. The gas transportation mechanism through ZIF-8/PVAc MMMs was also evaluated. The favorable interfacial interaction between the H of the imidazole in the ZIF-8 and ester groups of PVAc enhances the mechanical strength and plasticization resistance of the neat polymer

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