

ABSTRACT:

Development of polymeric gas separation membranes is one of the fastest growing branches of membrane technology. However, polymeric materials are somewhat deficient in meeting the requirements of current membrane technology. Mixed matrix membrane (MMM), comprising rigid permeable or impermeable particles, such as zeolites, carbon molecular sieves, silica and carbon nanotubes, dispersed in a continuous polymeric matrix presents an interesting approach for improving the separation properties of polymeric membranes. In this approach, using properties of both the organic and inorganic phase, a membrane with good permeability, selectivity, mechanical strength, and thermal, chemical stability and processibility can be prepared. In this paper the performance studies of MMM for gas separation were critically reviewed. In addition, the materials selection and the preparation techniques of MMM were also discussed. Methodology in improving the interface defects in the MMM and its effect on the separation performance have also been reviewed. The models for predicting the performance of MMM for gas separation have been discussed in details and the future direction of research and development to fully exploit the potential usage of MMM was shown.