عنوان مقاله:

SurfaceModification of Carbon Nanotubes Using Acid Treatment to Enhance Gas Separation Performance of Hybrid Nanocomposite Mixed Matrix Membrane

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خلاصه مقاله:

Recently, many researchers have explored the idea of hybrid mixed matrix membranes. Membraneseparation processes based on hybrid mixed matrix membrane comprising inorganic material such as zeolite andcarbon nanotubes (CNTs) embedded in polymer matrix have become one of the emerging technologies andextensively discussed in membrane separation literature. The present study is performed primarily to investigatethe effect of chemical modification on carbon nanotubes surface towards gas separation performance of mixedmatrix membrane. Polyethersulfone (PES)-carbon nanotubes mixed matrix membrane for modified and unmodifiedcarbon nanotubes were casted using dry/wet phase inversion technique. The modified carbon nanotubes werepreprepared by treating the carbon nanotubes with acid treatment to allow PES chains to be attached to carbonnanotubes surface. The results of FESEM, DSC and FTIR analysis confirmed that chemical modification oncarbon nanotubes surface had taken place. Meanwhile, the nanogaps in the interface of polymer and carbonnanotubes were appeared in the PES mixed matrix membrane with unmodified of carbon nanotubes.The modified carbon nanotubes mixed matrix membrane increases the mechanical properties, the productivityand purity of gas mixture compare to neat PES and unmodified carbon nanotubes mixed matrix membrane.For PES-modified carbon nanotubes mixed matrix membrane the maximum .selectivity achieved for CO2/CH4 are32.59

کلمات کلیدی:

Mixed matrix membrane Carbon nanotubes Biogas Gas separation