World Academy of Science, Engineering and Technology
International Journal of Chemical and Molecular Engineering
Vol:8, No:12, 2014

Separation of CO2 Using MFI-Alumina Nanocomposite Hollow Fibre Ion-Exchanged with Alkali Metal Cation

Authors : A. Alshebani, Y. Swesi, S. Mrayed, F. Altaher, I. Musbah

Abstract : Cs-type nanocomposite zeolite membrane was successfully synthesized on a alumina ceramic hollow fibre with a mean outer diameter of 1.7 mm, cesium cationic exchange test was carried out inside test module with mean wall thickness of 230 µm and an average crossing pore size smaller than 0.2 µm. Separation factor of n-butane/H2 obtained indicate that a relatively high quality closed to 20. Maxwell-Stefan modeling provides an equivalent thickness lower than 1 µm. To compare the difference an application to CO2/N2 separation has been achieved, reaching separation factors close to (4,18) before and after cation exchange on H-zeolite membrane formed within the pores of a ceramic alumina substrate.

Keywords : MFI membrane, CO2, nanocomposite, ceramic hollow fibre, ion-exchange
Conference Title : ICCEPT 2014 : International Conference on Chemical Engineering and Process Technology
Conference Location : Istanbul, Turkey
Conference Dates : December 22-23, 2014