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

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Abstract : Cs-type nanocomposite zeolite membrane was successfully synthesized on an 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, nanocomposite, ceramic hollow fibre, CO2, ion-exchange
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