

Selective capillary diffusion of equimolar H₂/D₂ gas mixtures through etched ion track membranes prepared from polyethylene terephthalate and polyimide

Schmidt K, Friese K, Angert N, Trautmann C

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The selective capillary diffusion of equimolar H₂/D₂ gas mixtures through ion track membranes prepared from polyethylene terephthalate and polyimide was investigated at a temperature of 293 K, a primary pressure of 0.15 MPa and a secondary pressure of 10⁻⁴ MPa. Different values of the separation factor $Z(\text{H}_2/\text{D}_2)$ between experiment and computer simulation exists in the case of polyethylene terephthalate ion track membranes because of multiple pores. Membranes for which multiple pores were reduced by varying the irradiation angle showed an increased separation factor. The separation factor is a function of the pore diameter. This is shown for polyimide ion track membranes with a pore size in the range of 0.17 and 0.5 μm . After grafting with styrene the separation factor increased, indicating grafting within the pores.