

Fabrication and characterization of metal porous membrane made of Ni powder for hydrogen separation

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Porous membranes were prepared for hydrogen separation by uniaxial pressing of nickel powder at high pressure (over 558 MPa). Group 1(average particle size of 0.15 μ m), group 2(average particle size of 5 μ m) and those mixtures were prepared. Average pore diameter of pressed membranes could be controlled from 33nm to 115nm by mixing ratio of two powder groups. Permeation test was carried out at room temperature and 200 $^{\circ}$ C with single gas (pure hydrogen and nitrogen) with changing transmembrane pressure difference 0.015-0.101MPa. As results of gas permeation test, the gas permeation was contributed by Knudsen diffusion. The selectivity was increased with an increase of membrane compactness. To be more compacted, membrane had to have multi size distribution. And an increasing of fabrication pressure increased the compactness.