Thin Pd-composite membrane on porous nickel support by means of sputtering and polishing method

이신근*, 박종수, 황경란, 이성욱[1]
한국에너지기술연구원; [1]고려대학교
(h2membrane@kier.re.kr*)

This study shows that a highly selective Pd membrane can be depoaited on porous metal substrate by means of sputtering followed by polishing treatment. It is impossible to remove pinholes generated on the Pd membrane surface by sputtering only. Polishing treatment was introduced to remove the pinholes. SEM and helium leak tests confirmed that the polishing treatment was very effective method in removing the pinholes. Hydrogen permeation and helium leak tests showed that our membrane has very high H2/He selectivity (>40,000) at a pressure difference of 100 kPa and 673 K. Hydrogen permeation flux increased with increasing temperature and pressure difference to 1.8 mol m-2 s-1 at 673 K and 2,000 kPa. The advanatage of our manufacturing procedures is its simplicity and reproducibility.