The study on hydrogen purification with metal hydride

정헌도†, 김태환
한국에너지기술연구원
(hdjung@kier.re.kr†)

Hydrogen purification with a AB5-type metal hydride were studied for the development of hydrogen purification system. Metal hydride was investigated about its tolerance against impurities, pressure-compsition-isotherm and life cycle test, XRD and particle size analysis. Gas chromatograph was used for the analysis of feed and product gas. The used metal hydride is a La, Nd-rich Mm-based AB5 type which has the hydrogen storage capacity of 1.4 wt%. In life cycle test, there were no change of plateau pressure and hysteresis after 600 cycles but hydrogen storage capacity was decreased by about 6.8% and 10.7% after 220, 600 cycles, respectively. The used sample is high strong against CH4 and CO2 but very weak in CO atmosphere. The hydrogen purification performance with gas mixtures was decreased in the order of CH4 > CO > O2 > N2 > CO2. The reason CO investigated high purification effect in gas mixture is due to a strong chemisorption in metal hydride matrix that CO was not released out of the alloy.