

Study of Pt-doped NaY zeolite roles on the dehydrogenation of LiBH₄조인화, 임대운, 이희주, 김성준¹, 최용남[†]한국원자력연구원; ¹가천대학교(dragon@kaeri.re.kr[†])

LiBH₄ has been one of promising candidates as the solid-state hydrogen storage materials since it has high gravimetric and volumetric hydrogen storage capacities (18 wt%, 121 Kg/m³ H₂). However, the thermodynamic and the kinetic properties of LiBH₄ are not appropriate to use it at the ambient conditions. To overcome these drawbacks, the nano-confinement of LiBH₄ using nano-porous materials is the most effective method by keeping the size and the circumstances after reactions. In 2010, Turnbull reported that the melt-infiltrated LiBH₄ into the NaY zeolite showed that the dehydrogenation temperature was decreased by ~ 100 C. Inspired by the results, we prepared the samples which are the melt-infiltrated LiBH₄ into Pt nanoparticle doped NaY, to obtain synergetic effects of Pt nano-particles with nano-confined LiBH₄. We measured in situ x-ray diffraction patterns of the samples with different Pt contents at various temperatures. In this present, the roles of Pt nanoparticles and zeolite frameworks on to the dehydrogenation of LiBH₄ are discussed using the results of the x-ray diffraction measurement, TG-MS, DSC and BET.