

## Hydrogen storage properties of metal doped magnesium alanate

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Many researchers have been studied complex metal hydride since sodium alanate had been demonstrated to have reversible hydrogen storage property through addition of various transition metals. Hydrogen storage properties onto the metal doped magnesium alanate were investigated. On the basis of magnesium alanate, a series of metal doped magnesium alanate containing Ti, Nb, Sr and La were prepared and investigated in this work. The magnesium alanate was synthesized by methathesis reaction of  $\text{NaAlH}_4$  or  $\text{LiAlH}_4$  and  $\text{MgCl}_2$  in diethyl ether and metal doped magnesium alanate was produced by mechanical ball milling method. The obtained materials were characterized by X-ray diffraction and scanning electron microscopy. The metal doped magnesium alanate remarkably improved hydrogen release capability. The hydrogen release performance was decreased in the order of  $\text{Ti-Mg(AlH}_4)_2 > \text{Nb-Mg(AlH}_4)_2 > \text{La-Mg(AlH}_4)_2 > \text{Sr-Mg(AlH}_4)_2 > \text{pure-Mg(AlH}_4)_2$ . It was noticeable that the addition of Ti to the magnesium alanate remarkably stabilized the hydrogen release performance and reduced the hydrogen release temperature.