

Hydrogen release properties of solvent-free magnesium alanate

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Hydrogen is a clean fuel that has near zero emissions at the point of use and low well-to-wheel emission of both air pollutants and greenhouse gases. However, hydrogen storage or transportation system are very difficult because hydrogen is the most lightly material in the earth. Therefore, hydrogen storage technology has been widely studied from the viewpoint of using hydrogen energy efficiently. In this study, magnesium alanate, which is known to have higher hydrogen contents than sodium alanate, is synthesized by mechanochemically metathesis reaction method of magnesium chloride and sodium alanate without solvent and investigate synthesis, structure and hydrogen release properties. The effect of titanium based promoter on the performance of magnesium alanate is investigated in detail, with an aim to reducing thermal decomposition kinetics of magnesium alanate.