

Investigations on Metal Alanates using X-ray and Neutron Powder Diffraction

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We report extensive studies on 2% titanium-doped and un-doped sodium aluminium hydride using neutron powder diffraction data collected at 5K and 303K. This substance is of considerable interest because it has been shown to be promising as a material for effective hydrogen storage due to its high hydrogen weight capacity and low cost. [1] Doping with titanium renders the release of hydrogen reversible and the reaction is accelerated at moderate temperatures and pressures. [2] However, there is considerable argument concerning the precise form taken by the titanium in the doped alanate and there is, at present no definitive evidence for any particular theory. [3] These studies were undertaken with the aim of providing further insight into this question.

X-ray powder diffraction data has been collected on hydrided and dehydrided lithium and sodium aluminium hydrides. Studies on the precise nature of the phases present in these materials will be reported.

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