

Accepted Manuscript

Doping effect of Nb species on hydrogen desorption properties of AlH_3

Yuki Nakagawa, Chung-Hyun Lee, Kouki Matsui, Kohei Kousaka, Shigehito Isobe, Naoyuki Hashimoto, Shotaro Yamaguchi, Hiroki Miyaoka, Takayuki Ichikawa, Yoshitsugu Kojima

PII: S0925-8388(17)33707-6

DOI: [10.1016/j.jallcom.2017.10.273](https://doi.org/10.1016/j.jallcom.2017.10.273)

Reference: JALCOM 43670

To appear in: *Journal of Alloys and Compounds*

Received Date: 9 June 2017

Accepted Date: 29 October 2017

Please cite this article as: Y. Nakagawa, C.-H. Lee, K. Matsui, K. Kousaka, S. Isobe, N. Hashimoto, S. Yamaguchi, H. Miyaoka, T. Ichikawa, Y. Kojima, Doping effect of Nb species on hydrogen desorption properties of AlH_3 , *Journal of Alloys and Compounds* (2017), doi: 10.1016/j.jallcom.2017.10.273.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Doping effect of Nb species on hydrogen desorption properties of AlH_3

Yuki Nakagawa^{a*}, Chung-Hyun Lee^a, Kouki Matsui^a, Kohei Kousaka^a, Shigehito Isobe^a, Naoyuki Hashimoto^a, Shotaro Yamaguchi^b, Hiroki Miyaoka^c, Takayuki Ichikawa^d, Yoshitsugu Kojima^c

^a Graduate School of Engineering, Hokkaido University, N-13, W-8, Sapporo, 060-8278, Japan

^b Graduate School of Advanced Sciences of Matter, and ^c Natural Science Center for Basic Research and Development, Hiroshima University, 1-3-1 Kagamiyama, Higashi-Hiroshima, 739-8530, Japan

^d Graduate School of Engineering, Hiroshima University, 1-4-1 Kagamiyama, Higashi-Hiroshima, 739-8527, Japan.

ABSTRACT:

Hydrogen desorption properties of $\alpha\text{-AlH}_3$ doped with Nb species (Nb, Nb_2O_5 and NbF_5) were investigated. Doping Nb species improved the desorption properties of AlH_3 . In particular, 1 mol% NbF_5 -doped AlH_3 showed the lowest onset desorption temperature at 60 °C. Compared with Nb- or Nb_2O_5 -doped AlH_3 , the fine distribution of dopant was successfully achieved in NbF_5 -doped AlH_3 . The apparent activation energy for hydrogen desorption of AlH_3 was slightly decreased with the dopant of NbF_5 . The improvement of desorption properties might be due to the finely dispersed Nb and/or AlF_3 , which are formed by the reaction between NbF_5 and AlH_3 (surface Al_2O_3).

Keywords: Hydrogen storage; Aluminum hydride, Niobium Fluoride, Niobium oxide, Catalytic effect

Download English Version:

<https://daneshyari.com/en/article/7994591>

Download Persian Version:

<https://daneshyari.com/article/7994591>

[Daneshyari.com](https://daneshyari.com)