

Scientific Paper:

Journal of Alloys and Compounds 417, 92-95, 2006

Pressure-composition isotherms of TbNiAlH_x

H.W. Brinks^{a,*}, A. Fossdal^a, R.C. Bowman Jr.^b, B.C. Hauback^a

^aDepartment of Physics, Institute for Energy Technology, P.O. Box 40, NO-2027 Kjeller, Norway

^bJet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, USA

Abstract:

Accurate isotherms of TbNiAlH_x were measured at 60, 150, 200, 250 °C with a Sieverts-type apparatus. The intermediate TbNiAlH_{0.33} and TbNiAlH_x (0.4 < x < 0.6) hydrides were confirmed to be present at the higher temperatures. Orthorhombic TbNiAlH_x (x > 0.9) was detected at all temperatures. The hydrogen content after desorption at 10 mbar and 60 °C is similar to prolonged storage at room temperature. The reaction between hexagonal TbNiAlH_{0.6} and orthorhombic TbNiAlH_{0.9} was found to have a desorption enthalpy of 50.7 kJ/(mol H₂). Methodology and requirements for making accurate measurements of isotherms are discussed.

Key-words: Metal hydrides, pressure-composition isotherms, terbium aluminium hydride