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This document appeared in

Detlef Stolten, Thomas Grube (Eds.):

18th World Hydrogen Energy Conference 2010 - WHEC 2010

Parallel Sessions Book 4: Storage Systems / Policy Perspectives, Initiatives and Co-operations

Proceedings of the WHEC, May 16.-21. 2010, Essen

Schriften des Forschungszentrums Jülich / Energy & Environment, Vol. 78-4

Institute of Energy Research - Fuel Cells (IEF-3)

Forschungszentrum Jülich GmbH, Zentralbibliothek, Verlag, 2010

ISBN: 978-3-89336-654-5

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Abstract

The complex hydrides, particularly borohydrides, are currently under discussion as potential solid hydrogen storage materials. Their gravimetric hydrogen density exceeds that of transition metal hydrides by one order of magnitude. The electronic structure of complex hydrides such as LiBH_4 differs significantly from that of metallic hydrides, in which the hydrogen atoms occupy the interstitial sites of the metal host lattice. This has severe consequences for their physical and chemical properties such as the crystalline and electronic structure of the compound and ultimately their applicability as hydrogen storage materials. In a broader sense, certain organic hydrides have properties similar to those of complex hydrides and therefore are possibly suitable as hydrogen storage materials. In this chapter, we give an overview on the various materials and hydrogen storage solution based on them.

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