even at low temperature, confirming the strong interaction between LiBH4 and host material. Better understanding the effect of nanostructured materials allows to tuning their relevant physico-chemical properties and expands their range of applications to different fields.

add to my program (close full abstract)

10:15 Nanostructural C-Pd films for hydrogen applications

Authors : A.Kamińska, S.Krawczyk, E.Czerwosz, E.Kowalska, R.Diduszko, K.Sobczak
Affiliations : Tele and Radio Research Institute, Ratuszowa 11, 03-450 Warsaw, Poland

Resume : We propose nanostructured carbonaceous-palladium (C-Pd) films as promising material for covering different, big surfaces as improving hydrogen storing properties material. The C-Pd films were obtained by annealing of samples prepared by physical vapor deposition on different substrates. Palladium nanocrystallites placed within the film volume and also on its surface enhanced absorption of hydrogen due to dissolution of H2 molecules in the nanocrystallites. We studied structure, morphology and topography of these films by different methods (XRD, SEM, EDS and TEM). The prepared films had different palladium content. The film's sensing properties toward hydrogen connected with XRD, EDS and TEM results allowed us to estimate an amount of absorbed hydrogen. We propose a model of hydrogen absorption mechanism in our films. This project is co-financed by the European Regional Development Fund within the Innovative Economy Operational Programme 2007-2013 No. UDA-POIG.01.03.01-14-071/08-08.

4
5

add to my program (close full abstract)

10:30 coffee break

Nanostructuring of Chemical hydrides and High Surface Materials : Torben Jensen

11:00 Strategies to improve the dehydrogenation of ammonia borane, a promising chemical hydrogen storage material: from nanoconfinement to chemical modification, via chemical doping

Authors : Umit B. DEMIRCI
Affiliations : IEM (Institut Europeen des Membranes), UMR 5635 (CNRS-ENSCM-UM2), Universite Montpellier 2, Place E. Bataillon, F- 34095, Montpellier, France

Resume : In chemical hydrogen storage, ammonia borane NH3BH3 (AB) is a promising candidate owing to a high gravimetric hydrogen density (19.5 wt% H). A huge attention has been dedicated to this material in the past decade. Ammonia borane is stable under inert and moisture-free atmosphere. The challenge is to dehydrogenate it in mild conditions. The first way to dehydrogenate AB is hydrolysis. In room conditions, AB (aq) hydrolyzes in the presence of a catalyst; 3 mol H2 per mol AB can be liberated, with half of H2 provided by water. However, this approach suffers from a low effective gravimetric hydrogen storage capacity, the evolution of NH3, and the difficult recyclability of the borate by-products. The second way to dehydrogenate AB is thermolysis. Under heating at 5°C/min, AB melts at ca. 100°C and then decomposes into H2 and some unwanted by-products (mainly borazine B3N3H6) over the range 100-200°C. To make AB viable, it is thus important to decrease the temperature of dehydrogenation while avoiding the evolution of any by-products. Accordingly, several strategies have been adopted to destabilize AB: (i) dispersion of AB in a solvent and/or (ii) use of a homogenous catalyst; (iii) chemical doping; (iv) insertion of AB in a porous host material (nanoconfinement); and, (v) chemical modification to elaborate derivatives such amidoboranes or hydrazine borane. The E-MRS Fall Meeting will be an opportunity to present our last achievements in thermolysis of AB.

5
1

add to my program (close full abstract)

11:30 Hybrid Hydride Materials

Authors : Y. Filinchuk, I. Dovgaliuk, V. Ban, N. Tumanov, F. Morelle
Affiliations : Institute of Condensed Matter and Nanosciences, Université Catholique de Louvain, pl. L. Pasteur 1, 1348 Louvain-la-Neuve, Belgium

Resume : Recently the first porous hydride, gamma-Mg(BH4)2, featuring so-called "borohydride framework" capable to store reversibly guest species was discovered [1]. This example clearly show that the covalently bound hydride moieties, such as borohydride, amide, ammonia borane, amidoborane etc can act as directional ligands, capable to form molecular and polynuclear complexes, as well as framework structures typically occurring in classical coordination chemistry. We suggest that the auxiliary building blocks, such as azolates [2] can drastically expand the chemistry of hydrides, creating the