

**MATERIALS RESEARCH SOCIETY**  
**SYMPOSIUM PROCEEDINGS VOLUME 1098**

# **Hydrogen Economy**

March 24-28, 2008  
San Francisco, California, USA

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

ISBN: 978-1-60560-854-9

**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2008) by the Materials Research Society  
All rights reserved.

Printed by Curran Associates, Inc. (2009)

For permission requests, please contact the Materials Research Society  
at the address below.

Materials Research Society  
Proceedings  
506 Keystone Dr.  
Warrendale, PA 15086

Phone: 724-779-3004 x 531  
Fax: 724-779-4396

[eproceedings@mrs.org](mailto:eproceedings@mrs.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

<b>Crystal Chemistry of Hydrogen Storage Materials</b> .....	1
<i>M.O. Jones, W.I.F. David, S.R. Johnson, M. Sommariva, R.L. Lowton, E.A. Nickels, P.P. Edwards</i>	
<b>Oxide Ion Conduction of Ytria-stabilized Zirconia Films Deposited by Atomic Layer Deposition</b> .....	11
<i>C. Chao, H. Huang, J.S. Park, F.B. Prinz</i>	
<b>Structural and Mechanical Stability of Reduced Nickel Oxide/Ytria-stabilized Zirconia Anode/Electrolyte Structures for Solid Oxide Fuel Cell Applications</b> .....	15
<i>B. Biswas, N. Thangamani, N.T. Saraswathi, J. Zhang, S. Bandopadhyay</i>	
<b>Mechanism of Hydrogen Storage on Reduced Carbon Single-Walled Nanotubes</b> .....	21
<i>C.J. Curtis, T. Gennett, C. Engrakul, K. O'Neill, J.E. Ellis, M.J. Heben</i>	
<b>Microstructure and Hydrogen Absorption/Desorption Behavior of Nanoporous Pd Thin Films</b> .....	27
<i>W. Li, S.C. Schendel, T.J. Balk</i>	
<b>Studies on Proton Conductivity and Methanol Permeability of Poly(ether sulfone)/Sulfonated Poly(ether ether ketone) Blend Membranes</b> .....	33
<i>H. Zhu, W. Yang, Y. Wei, W. Yang, X. Yu, X. Cao</i>	
<b>The Hydrolysis and Oxidation Behavior of Lithium Borohydride and Magnesium Hydride Determined by Calorimetry</b> .....	40
<i>K.S. Brinkman, J.R. Gray, B. Hardy, D.L. Anton</i>	
<b>Ab Initio Alloying of Mg for Hydrogen Storage</b> .....	48
<i>D. Kecik, M.K. Aydinol</i>	
<b>Study of the Crystal Structure and Phase Transition of Li<sub>2</sub>NH System</b> .....	54
<i>J. Yang, J. Lamsal, Q. Cai, W.B. Yelon, W.J. James</i>	
<b>Effect of Pore Size on Dehydrogenation Temperature of Carbon Cryogel-Ammonia Borane Nanocomposites</b> .....	60
<i>S. Sepehri, B.B. Garcia, G. Cao</i>	
<b>Nanogravimetric Evaluation of Hydrogen Uptake in Thin Film Materials by A Quartz Crystal Microbalance</b> .....	65
<i>T. Xu</i>	
<b>Hydrogenation Of The Titanium Aluminides</b> .....	71
<i>N. Kazantseva, N.V. Mushnikov, A.G. Popov, V.A. Sasonova, P.B. Teren'ev</i>	
<b>Thermodynamics of Gaseous Hydrogen and Hydrogen Transport in Metals</b> .....	78
<i>C.S. Marchi, B.P. Somerday</i>	

<b>Characterization of Materials for a Hydrogen-Based Economy by Cold Neutron Prompt Gamma-Ray Activation Analysis</b> .....	90
<i>R. Paul, L.R. Cao</i>	
<b>Hydrogen Storage Properties of a Combined Li<sub>3</sub>AlH<sub>6</sub>-LiBH<sub>4</sub> System</b> .....	96
<i>Y.J. Choi, J. Lu, H.Y. Sohn, Z. Fang</i>	
<b>Anode Composites Based on NiO and Apatite-Type Lanthanum Silicate for Intermediate Temperature Solid Oxide Fuel Cells</b> .....	104
<i>T. Kharlamova, S. Pavlova, V. Sadykov, T. Krieger, G. Alikina, J. Frade, C. Argiris</i>	
<b>Design and Characterization of Nanocomposites Based on Complex Perovskites and Doped Ceria as Advanced Materials for Solid Oxide Fuel Cell Cathodes and Membranes</b> .....	110
<i>V. Sadykov, T. Kharlamova, L. Batuev, N. Mezentseva, G. Alikina, V. Muzykantov, T. Krieger, S. Pavlova, V. Zaikovskii, A. Ishchenko, V. Zarubina, V. Rogov, O. Bobrenok, N. Uvarov, J. Kilner, J. Druce, A. Smirnova</i>	
<b>Electrical and Optical Responsivity of Thin Palladium Films During Hydrogen Exposure</b> .....	116
<i>S.K. Earles, K. Yalamanchili, I.N. Kostanic, M. Nazer, M.P. De Fernandez, M.H. McCay</i>	
<b>Hydrogen Affinity of Silica-based Nanocomposite for High Temperature Hydrogen Separation Membranes</b> .....	122
<i>Y.H. Ikuhara, T. Saito, K. Hataya, Y. Iwamoto, S. Takahashi</i>	
<b>Author Index</b>	