IEA Hydrogen Implementing Agreement Task 17
Solid and Liquid State Hydrogen Storage Materials

List of Publications, Presentations and Patents

[PU]=Publication, [PR]=Presentation, [PA]=Patent

Carbon Projects

Project C-1. Hydrogen storage in single-wall carbon nanotubes (R. Chahine [Canada] and M. Heben [USA])

E. Poirier, R. Chahine, A. Tessier, T.K. Bose: "Precise sorption measurement systems with in situ conditioning", 14th World Hydrogen Energy Conference, June 9-13, 2002, Montreal, QC, Canada [PR + PU]

B. Simard, et al.: "Aspects of Hydrogen Storage in Nanostructured Carbon in Canada", 14th World Hydrogen Energy Conference, June 9-13, 2002, Montreal, QC, Canada [PR + PU]

A.C. Dillon: invited talk "Controlling Single-wall Carbon Nanotube Size and Type with Laser Peak Pulse Power", A.C. Dillon, J.L. Alleman, P.A. Parilla, K.E.H. Gilbert, K.M. Jones, and M.J. Heben at the Gordon Conference on "Laser Interactions with Materials", Jul 21-26, 2002 [PR]

A.C. Dillon, K.E.H. Gilbert , T. Gennett, L. Grigorian, J.L. Alleman, K.M. Jones, P.A. Parilla, M.J. Heben: "Hydrogen Storage in Single-Wall Carbon Nanotubes", 14th Annual World Hydrogen Energy Conference, June 9-13, 2002, Montreal, QC, Canada [PR + PU]

A.C. Dillon, K.E.H. Gilbert, P.A. Parilla, J.L. Alleman, G.L. Hornyak, K.M. Jones, M.J. Heben: "Carbon Nanotubes for Hydrogen Storage", Proceedings of the 2002 U.S. Department of Energy Hydrogen Program Annual Review Meeting, Golden, May 6-8, 2002, NREL [PR+PU]

G. L. Hornyak, L. Grigorian, A. C. Dillon, P. A. Parilla, K. M. Jones, M. J. Heben: "A Temperature Window for Chemical Vapor Decomposition Growth of Single-Wall Carbon Nanotubes" J. Phys. Chem. B, **106** (2002), 2821-2825 [PU]

A.C. Dillon, P.A. Parilla, J.L. Alleman, T. Gennett, K.E.H Gilbert, K.M. Jones, M.J. Heben: "Defect-activated Raman D-Band in Pure Bulk Carbon Single-Wall Nanotubes", submitted to Phys. Rev. B. [PU]

M.J. Heben, T.J. Hendricks: "Carbon Nanotube Heat-Exchange Systems" patent application [PA]

A.C. Dillon, T. Gennett, M.J. Heben: "Single-Wall Carbon Nanotubes for Hydrogen Storage or Superbundle Fromation" patent application filed 04/02 [PA]

A.C. Dillon, T. Gennett, M.J. Heben: "Metal-Doped Single-Walled Carbon Nanotubes and Production Thereof" patent application filed 07/02 [PA]

G.L. Hornyak, L. Grigorian, A.C. Dillon, M.J Heben: “Continuous CVD Growth of Single-wall Carbon Nanotubes” patent application filed 04/02 [PA]

A.C. Dillon, A.H Mahan, J.L. Alleman, M.J. Heben, P.A. Parilla, K.M. Jones: “Hot Wire Chemical Vapor Deposition of Carbon Nanotubes” Thin Sol. Films, (in press) [PU]

A.C. Dillon, A.H Mahan, J.L. Alleman, M.J. Heben, P.A. Parilla, K.M. Jones: “Hot Wire Chemical Vapor Deposition of Carbon Nanotubes” 2nd International Conference on Cat-CVD (Hot-Wire CVD) Process, Denver, CO, USA, Sept. 2002 [PR]

A. H. Mahan, J.L. Alleman, M.J. Heben, P.A. Parilla, K.M. Jones, A.C. Dillon: “Hot Wire Production of Isolated Carbon Single-wall Nanotubes”, Appl. Phys. Lett., **81** (2002) 4061-4063 [PU]

G. L. Hornyak, L. Grigorian, A.C. Dillon, P.A. Parilla, K.M. Jones, M. J. Heben: “A Temperature Window for CVD Growth of Single-wall Carbon Nanotubes,” J. Phys. Chem. B, **106** (2002) 2821 [PU]

A.C. Dillon, K.E.H. Gilbert, P.A. Parilla, T. Gennett, J.L. Alleman, K.M. Jones, M.J. Heben: “Hydrogen Storage in Single-wall Carbon Nanotubes”, International Workshop on Hydrogen in Materials and Vacuum Systems, Jefferson Lan, Newport News, VA, USA, Nov. 11-12, 2002 [PR+PU]

E. Poirier, R. Chahine, P. Bénard, D. Cossement, L. Lafi, É. Mélançon, T.K. Bose, S. Désilets, “Storage of hydrogen on single-walled carbon nanotubes and other carbon structures”, To appear in J. of Appl. Phys. (2003) [PU]

L. Lafi, D. Cossement, R. Chahine, “Effect of Inorganic Chemicals on the Stability and Porosity of HiPco Single-Wall Carbon Nanotubes”, submitted for publication in J. Phys. Chem. (2003) [PU]

É. Poirier, R. Chahine, T.K. Bose, D. Cossement, S. Désilets, L. Lafi, A. Tessier, “Hydrogen storage in single-walled carbon nanotubes: methods and results”, Hydrogen and Fuel Cells 2003 Conference, Vancouver, June 8-11. [PR + PU]

Project C-2. Hydrogen storage in carbon nanotubes (T. Mays [UK])

Project no longer active.

E. Alain, Y.-F. Yin, T.J. Mays, B. McEnaney: "Molecular simulations and measurement of adsorption in porous carbon nanotubes", Stud. Surf. Sci. Catal., **128** (2000) 313-322 [PU]

Y.-F. Yin, T.J. Mays, B. McEnaney: "Molecular simulations of hydrogen storage in carbon nanotube arrays", Langmuir, **16** (2000) 10521-10527 [PU]

B. McEnaney, E Alain, Y.-F. Yin, T.J. Mays: "Porous carbons for gas storage and separation", In Design and Control of Structure of Advanced Carbon Materials for Enhanced Performance (B. Rand, S.P. Appleyard, M.F. Yardim, Eds.), Kluwer, Dordrecht (2001) pp.295-318 [PU]

P.M. Barata-Rodrígues, G.D. Moggridge:, T.J. Mays, N.A. Seaton: "Development of adsorbent carbons using inorganic templates", In Fundamentals of Adsorption–7 (K. Kaneko, Ed.)., IK International, Tokyo (2002) pp.215-222 [PU]

T.J. Mays, E. Alain, Y.-F. Yin: "Adsorption and structure in carbon nanotubes", In Fundamentals of Adsorption–7, (K. Kaneko, Ed.), IK International, Tokyo (2002) pp.893-990 [PU]

P.M. Barata-Rodrígues, T.J. Mays, N.A. Seaton, G.D. Moggridge: "Comparison of porous carbons developed via templating approaches", Stud. Surf. Sci. Catal. **144** (2002) 139-146 [PU]

Project C-3. High pressure X-ray diffraction measurements of hydrogen in nano-structured carbon (P. Hall [UK])

Project no longer active.

Project C-5. Hydrogen storage in carbon-based materials (R. Jones [UK])

D.J. Browning, M.L. Gerrard, J.B. Lakeman, I.M. Mellor, R.J. Mortimer, M.C. Turpin: “The use of carbon nanofibres as hydrogen storage materials”, Proc. 39th Power Sources conf., Cherry Hill, NJ, June 12-15, 2000, pp. 192-194 [PR+PU]

D.J. Browning, M.L. Gerrard, J.B. Lakeman, I.M. Mellor, R.J. Mortimer, M.C. Turpin: “Investigation of the hydrogen storage capacities of carbon nanofibres prepared from an ethylene precursor”, Hydrogen Energy Progress XIII, Proc. 13th World Hydrogen Energy Conference, Beijing, June 11-15, 2000 [PR+PU]

D.J. Browning, M.L. Gerrard, J.B. Lakeman, I.M. Mellor, R.J. Mortimer, M.C. Turpin: “Studies into the storage of hydrogen in carbon nanofibres: proposal of a possible reaction mechanism”, Nanoletters, **2** (2003) 201-205 [PU]

M. Turpin, I. Mellor, R.A. Shatwell, C. Prentice, D.J. Browning, J.B. Lakeman, M.L. Gerrard, R.J. Mortimer: “Hydrogen storage in carbon nanofibres for defence applications: the influence of growth parameters on graphitic quality and storage capacity”, Proc. 14th World Hydrogen Energy Conf., Montreal, June 9-13, 2002 [PR+PU]

R.A. Shatwell: "Hydrogen storage in carbon nanostructures", in "Fuel Cells for Automotive Applications", ed. R.H. Thring, Professional Engineering Publishing, Bury St Edmonds, UK ISBN 1 86058 423 3 [PU]

Project C-6. Modified carbon nanotubes for hydrogen storage (R. Zidan [USA])

R. Zidan: “Doped Carbon Nanotubes for Hydrogen Storage”, Proceedings of the 2002 U.S. DOE Hydrogen and Fuel Cells Program Annual Program/Lab R&D Review, Golden, May 6-10, 2002, Report NREL/CP 610-32405 [PR+PU]

Project C-8. Enhancing the hydrogen storage capacity of carbon nanofibres (G. Walker [UK])

M. Bououdina, D.G. Grant, G.S. Walker: "Modification of Carbon Nanofibres", International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

Project C-9. Hydrogen storage in single wall carbon nanotubes (M.T. Martínez, [Spain])

A. Ansón, M.A. Callejas, A.M. Benito, W.K. Maser, J. Jagiello, M. Thommes, J.B. Parra, M.T. Martínez: "Effects of an oxidative process on hydrogen adsorption in single walled carbon nanotubes", Cabon 2003 Conference, Oviedo (Spain) [PR]

A. Ansón, M.A. Callejas, A.M. Benito, W.K. Maser, M. Benham, J. Jagiello, A. Züttel, M.T. Martínez. "Hydrogen adsorption on a single-walled carbon nanotube material: A comparative study of three different adsorption techniques"**.** Trends in Nanotechnology 2003. Salamanca (Spain), September, 2003 [PR]

M.A. Callejas, A. Ansón, A.M. Benito, W. Maser, J.L.G. Fierro, M.L. Sanjuán and M.T. Martínez: "Enhanced hydrogen adsorption on single wall carbon nanotubes by sample reduction". E-MRS Spring Meeting 2003. Strasburg (France) June, 2003 [PR]

Project C-10. Nanostructured carbons for hydrogen storage (N. Gallego [USA])

New project for 2004-2006 Task Extension.

Combined Hydride + Carbon Projects

Project HC-1. H-storage in nano-structured carbon-related materials and hydrides (H. Fujii and S. Orimo [Japan])

S. Orimo, F. Kimmerle, G. Majer: "Hydrogen in nanostructured vanadium-hydrogen systems", Physical Review B, **63** (2001) 094307 (10 pages) [PU]

S. Orimo, H. Fujii: "Materials science of Mg-Ni-based new hydrides", Applied Physics A **72**, (2001) 167-186 [PU]

S. Orimo, T. Matsushima, H. Fujii, T. Fukunaga, G. Majer: "Hydrogen desorption property of the mechanically prepared nanostructured graphite", J. Appl. Phys., **90** (2001) 1545-1549 [PU]

T. Fukunaga, K. Itoh, S. Orimo, M. Aoki, H. Fujii: "Location of deuterium atoms absorbed in nanocrystalline graphite prepared by mechanical alloying", J. Alloys and Compounds, **327** (2001) 224-229 [PU]

S. Orimo, T. Matsushima, P. Wang, J. Gottwald, H. Fujii: "Nanostructured Carbon-related Materials for Hydrogen Storage", Proceedings 14th World Hydrogen Energy Conference, Montreal, June 9-13, 2002 [PR+PU]

P. Wang, S. Orimo, T. Matsushima, H. Fujii, G. Majer: "Hydrogen in mechanically prepared nanostructured h-BN: a critical comparison with that in nanostructured graphite", Appl. Phys. Lett., **80** (2002) 318-320 [PU]

Y. Kitano, K. Yamada, T. Matsushima, S. Orimo, H. Fujii, H.: "Electron microscopy and hydriding properties of $MgYNi_4$ synthesized by mechanical alloying", J. Alloys and Compounds, **330-332** (2002) 292-295 [PR+PU]

K. Higuchi, K. Yamamoto, H. Kajioka, M. Honda, S. Orimo, H. Fujii: “Remarkable hydrogen storage properties in three-layered Pd/Mg/Pd thin films”, J. Alloys and Compounds, **330-332** (2002) 526-530 [PU]

K. Yamamoto, K. Higuchi, H. Kajioka, M. Honda, H. Sumida, S. Orimo, H. Fujii: “Optical transmission of magnesium hydride thin film with characteristic nanostructure”, J. Alloys and Compounds, **330-332** (2002) 352-356 [PU]

H. Fujii, S. Munehiro, K. Fujii, S. Orimo: “Effect of mechanical grinding under Ar and H_2 atmospheres on structural and hydriding properties in $LaNi_5$“, J. Alloys and Compounds, **330-332** (2002) 747-751 [PR+PU]

T. Fukunaga, K. Itoh, S. Orimo. H. Fujii: “Structural observation of energy storage materials prepared by MA”, Physica B **311** (2002) 95-101 [PU]

S. Orimo, T. Matsushima, P. Wang, H. Fujii, T. Funanaga, G. Majer, A. Züttel, L. Schlapbach” Hydrogen in Carbon Nanostructures”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

H. Fujii, K. Higuchi, K. Yamamoto, H. Kajioka, S. Orimo, K. Toiyama: “Remarkable hydrogen storage, structural and optical properties in multi-layered pd/Mg thin films”, Mater. Trans. **43** (2002) 2721-2727 [PU]

Y. Nakamori, S. Orimo, T. Ekino, H. Fujii: “Synthesis of the binary intermetallic superconductor MgB_2 under hydrogen pressure”, J. Alloys and Compounds **335** (2002) L21-L24 [PU]

S. Orimo, A. Züttel, L. Schlapbach, G. Majer, T. Fukunaga, H. Fujii: “Hydrogen interaction with carbon nanostructures: current situation and future prospects”, International Symposium on Metal Hydrogen Systems (MH2002), J. Alloys and Compounds **356-357** (2003) 716-719 [PR+PU]

N. Hanada, S. Orimo, H. Fujii: “Hydriding properties of ordered-/disordered-Mg based ternary Laves phase structures”, International Symposium on Metal Hydrogen Systems (MH2002), J. Alloys and Compounds, **356-357** (2003) 429-432 [PR+PU]

K. Itoh, Y. Miyahara, S. Orimo, H. Fujii, T. Kamiyama, T. Fukunaga: “The local structure of hydrogen storage nanocrystalline graphite by neutron scattering, International Symposium on Metal Hydrogen Systems (MH2002), J. Alloys and Compounds, **356-357** (2003) 608-611

G. Majer, E. Stanik, S. Orimo: “NMR studies of hydrogen motion in nanostructured hydrogen-graphite systems, J. Alloys and Compounds, to be published [PU]

H. Fujii and S. Orimo; Hydrogen storage properties in nano-structured magnesium and carbon-related materials. Physica B **328** (2003) 77-80 [PU]

P. Wang, S. Orimo, K. Tanabe, H. Fujii: “Hydrogen in mechanically milled amorphous boron”, J. Alloys and Compounds **350** (2003) 218-221 [PU]

D. M. Chen, T. Ichikawa, H. Fujii, N. Ogita, M. Udagawa, Y. Kitano, E. Tanabe: Unusual hydrogen absorption properties in graphite mechanically milled under various hydrogen pressures up to 6 MPa. J. Alloys and Compounds **354** (2003) L5-L9 [PU]

H. Fujii, J. I. Gottward, T. Ichikawa: “Recent development on hydrogen storage systems”, Fuel Chemistry Division Preprints **47**(1) (2003) 523-524 [PU]

G. Majer, U. Eberle, F. Kimmerle, E. Stanik, S. Orimo: “Hydrogen diffusion in metallic and nanostructured materials”, Physica B, in press [PU]

P. Wang, S. Orimo, H. Fujii: “Characterizaition of hydrogenated amorphous boron by a combination of infrared absorption spectroscopy and thermal analyses”, J. Alloys and Compounds, in press [PU]

T. Ichikawa, S. Isobe, N. Hanada, H. Fujii: “Lithium Nitride for Reversible Hydrogen Storage”, J. Alloys and Compounds, in press [PU]

S. Isobe, T. Ichikawa, J.I. Gottwald, E. Gomibuchi; H. Fujii: “Catalytic effect of 3d transition metals on hydrogen storage properties in mechanically milled graphite”, J. Phys. Chem. Solids, in press [PU]

T. Ichikawa, D.M. Chen, S. Isobe, E. Gomibuchi, H. Fujii: “Hydrogen storage properties of mechanically milled graphite”, Mat. Sci. Eng. B – Solids, in press [PU]

N. Hanada, T. Ichikawa, S. Orimo, H. Fujii: “Correlation between hydrogen storage properties and structural characteristics in mechanically milled magnesium hydride MgH_2”, J. Alloys and Compounds, in press [PU]

Project HC-3. Structural characterization of hydrogen storage materials (B. Hauback [Norway])

B.C. Hauback, H.W. Brinks, V.A. Yartys: “Studies of new metal hydrides”, International Conference on Neutron Scattering, ICNS2001, Germany, 2001 [PR]

B.C. Hauback, H.W. Brinks, H. Fjellvåg: “Accurate structure of $LiAlD_4$ studied by combined powder neutron and X-ray diffraction”, J. Alloys and Compounds, **346** (2002) 184-189 [PU].

H.W. Brinks, B.C. Hauback, P. Norby, H. Fjellvåg: “In-situ studies of $LiAlD_4$”, 2. User meeting Norwegian Synchrotron Research, Sola, June 2002 [PR]

B.C. Hauback, H.W. Brinks, P. Norby, H. Fjellvåg: “$LiAlD_4$ studied by in-situ powder diffraction”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

O.M. Løvvik, H.W. Brinks, B.C. Hauback: “Density functional study of $LiAlH_4$”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

H.W. Brinks, B.C. Hauback, P. Norby, H. Fjellvåg: “Structural studies of $LiAlD_6$”, MRS Fall Meeting, Boston, December 2002 [PR]

H.W. Brinks, B.C. Hauback, P. Norby, H. Fjellvåg, H.: “The decomposition of $LiAlD_4$ studied by in-situ X-ray and neutron diffraction”, J. Alloys and Compounds **351** (2003) 222-227 [PU]

H.W. Brinks, B.C. Hauback: "The structure of Li_3AlD_6", J. Alloys and Compounds **354** (2003) 143-147 [PU]

B.C. Hauback, H.W. Brinks, C. M. Jensen, K. Murphy, A.J. Maeland: "Neutron diffraction structure determination of $NaAlD_4$", J. Alloys and Compounds **358** (2003) 142-145 [PU] (see also Project H-11)

D. Blanchard, H.W. Brinks, B.C. Hauback, P. Norby: "Doping and decomposition of $LiAlD_4$", E-MRS meeting, Strasbourg, France, June 2003 [PR]

H.W. Brinks, B.C. Hauback, D. Blanchard, C.M. Jensen: "Structural studies of alanates", E-MRS meeting, Strasbourg, France, June 2003 [PR]

C.M. Jensen, D. Sun, S.S.R. Srinivasan, K. Murphy, S. Eaton, T. Kiyobayashi, H.T. Takeshita, N. Kuriyama, B.C. Hauback, H.W. Brinks, A.J. Maeland: "Doped sodium aluminium hydride: fundamental studies and development of a promising new hydrogen storage material", E-MRS meeting, Strasbourg, France, June 2003 [PR] (see also Project H-11)

D. Blanchard, H.W. Brinks, B.C. Hauback, P. Norby: "Doping and decomposition of $LiAlD_4$", 2th SNBL Highlight meeting, Tromsø, Norway, June 2003 [PR]

B.C. Hauback: "Structural studies of alanates", Gordon Research Conference, Hydrogen Metal Systems, USA, July 2003 [PR]

C.M. Andrei, J. Walmsley, H.W. Brinks, R. Holmestad, B.C. Hauback: "Electron microscopy studies of lithium aluminium hydrides", Gordon Research Conference. Hydrogen Metal Systems, USA, July 2003 [PR]

D. Blanchard, H.W. Brinks, B.C. Hauback, P. Norby: "Doping and decomposition of $LiAlD_4$", 1. European Hydrogen Energy Conference, Grenoble, France, September 2003 [PR]

H.W. Brinks, B.C. Hauback: "Structure solution from powder diffraction data", SSPD'03, Slovakia, September 2003 [PR]

H.W. Brinks, B.C. Hauback: "Diffraction and stability studies of alanates", Nordic Hydrogen Seminar, Reykjavik, Iceland, November 2003 [PR]

B.C. Hauback: "Hydrogen storage in alanate compounds", Light Metals for Hydrogen Storage, Uppsala, Sweden, November 2003 [PR]

D. Blanchard, H.W. Brinks, B.C. Hauback, P. Norby: "Desorption of $LiAlH_4$ with Ti- and V-based additives", Mater. Sci. Eng. B (2003), in press [PU]

O.M. Løvvik, S.M. Opelka, H.W. Brinks, B.C. Hauback: "Crystal structure and thermodynamic stability of the lithium alanates $LiAlH_4$ and Li_3AlH_6" Phys. Rev. B (2003), submitted [PU]

H.W. Brinks, C.M. Jensen, S.S. Srinivasan, B.C. Hauback, D. Blanchard, K. Murphy: "Synchrotron X-ray and neutron diffraction studies of $NaAlH_4$ containing Ti additives" J. Alloys and Compounds (2003), submitted [PU] (see also Project H-11)

Project HC-5. H-storage in nanostructured carbon and metals (A. Züttel [Switzerland])

A. Züttel, Ch. Nützenadel, Ph. Mauron, Ch. Emmenegger, P. Sudan, L. Schlapbach, A. Weidenkaff, T. Kiyobayashi, S. Orimo: “Synthesis and Application of C-Nanotubes”, Proceedings of EuroCarbon 2000, Berlin, p. 1083 [PR+PU]

L. Schlapbach, A. Züttel, Ch. Nützenadel, P. Gröning, O. Gröning: “Das Potenzial neuer Materialien in der Energietechnik; Beispiele im Bereich Wasserstoff-Kohlenstoff-Metalle”, Energiepolitik zwischen Nachhaltigkeit und Liberalisierung, G. Schneider, Herausgeber, Verlag Rüegger (2000) ISBN 3-7253-0689-3 [PU]

S.-C. Han, P.S. Lee, J.-Y. Lee, A. Züttel, L. Schlapbach: “Effects of Ti on the cycle life of amorphous MgNi-based alloy prepared by ball milling”, Journal of Alloys and Compounds **306** (2000), 219-226 [PU]

Ch. Emmenegger, P. Mauron, A. Züttel, Ch. Nützenadel, A. Schneuwly, R. Gallay, L. Schlapbach, „Carbon Nanotubes Synthesized on Metallic Substrates“, Applied Surface Sciences **162-163** (2000), pp. 452-456 [PU]

A. Weidenkaff, S.G. Ebbinghaus, A. Reller, Ph. Mauron, Y. Zhang, A. Züttel: “Metal nanoparticles for the production of carbon nanotubes by decomposition of different carbon sources” Materials Science Eng., **19** (2001) 119-123 [PU]

A. Züttel: “Characterisation of CNT and interaction of CNT's with hydrogen”, invited talk at IMRA Europe S.A., Sophia Antipolis, France, 31 Jan. 2001 [PR]

A. Züttel: “Hydrogen Interaction with Carbon Nanostructures“, invited talk, 6th International Symposium on Electrochemical/Chemical Reactivity of Amorphous and Nanocrystalline Materials, Mt-Tremblant, Québec, Canada, 9 Feb. 2001 [PR]

A. Züttel: “Theory of Hydrogen Sorption in Carbon Nanotubes”, Project Meeting FUCHSIA, University of Fribourg, Switzerland, 9 Mar. 2001 [PR]

A. Züttel: “Structure of Carbon Nanotubes and Modelling of the Hydrogen Absorption“, BMBF Meeting, Universität Karlsruhe, Germany, 13 Mar 2001 [PR]

A. Züttel: “Limits of the Hydrogen Absorption in Carbon Nanotubes“, BMBF Meeting, Bosch Stuttgart, Germany 3 May 2001 [PR]

A. Züttel: “First Results on Hydrogen Desorption from $LiBH_4$”, Project Meeting Fuchsia, University of Birmingham, England 21 Jun. 2001 [PR]

A. Züttel: “Final Conclusions on Hydrogen Storage in Carbon Nanotubes“, Project Meeting BMBF, MPI Stuttgart, Germany, 11 Jul. 2001 [PR]

A. Züttel: “Hydrogen in Micro- and Nanostructures“, invited talk TOP Nano 21, KTI Bern, 13. 7. 2001 [PR]

A. Züttel: “Hydrogen in and on Materials: The Storage Problem“, invited colloquium, University of Neuchâtel, Institut de Physique, 5 Nov. 2001 [PR]

A. Züttel: “Hydrogen in Micro- and Nanostructures“, Department Day, University of Fribourg, Physics Department, 14 Dec. 2001 [PR]

L. Schlapbach, A. Züttel: “Hydrogen storage materials for mobile applications”, Nature **414** (15 Nov. 2001) 353-358 [PU]

A. Züttel, P. Sudan, Ph. Mauron, Ch. Emmenegger, T. Kiyobayashi, L. Schlapbach: “Hydrogen interaction with carbon nanostructures”, J. Metastable and Nanocrystalline Materials, **11** (2001) 95-102 [PU]

L. Schlapbach, A. Züttel, P. Groning, O. Groning, P. Aebi: “Hydrogen for novel materials and devices”, Appl. Phys. A, **72** (2001) 245-253 [PU]

A. Züttel, P. Fischer, F. Fauth, A. Otto, V. Güther: “Phase analysis and atom distribution in the $Zr(V_{0.5}Ni_{0.5})_3D_x$ (x=4.6) alloy system with Laves-type AB_2 structure”, J. Alloys and Compounds, **333** (2002) 90-102 [PU]

A. Züttel, P. Sudan, Ph. Mauron, T. Kiyobayashi, Ch. Emmenegger, L. Schlapbach: “Hydrogen storage in carbon nanostructures”, Int. J. Hydrogen Energy, **27** (2002) 203-212 [PU]

A. Züttel, Ch. Nützenadel, P. Sudan, Ph. Mauron, Ch. Emmenegger, S. Rentsch, L. Schlapbach, A. Weidenkaff, T. Kiyobayashi: “Hydrogen sorption by carbon nanotubes and other carbon nanostructures”, J. Alloys and Compounds, **330-332** (2002) 676-682 [PR+PU]

T. Kiyobayashi, H. T. Takeshita, H. Tanaka, N. Takeichi, A. Züttel, L. Schlapbach, N. Kuriyama, “Hydrogen Absorption in Carbonaceous Materials – How to Determine the Storage Capacity Accurately”, J. Alloys and Compounds, **330-332** (2002) 666-669 [PR+PU]

L. Schlapbach, A. Züttel, Ch. Emmenegger, Ph. Mauron, P. Sudan: “Hydrogen-Solid Interaction to Store Energy for Mobility”, TMS2002, The Minerals, Metals & Materials Society, Seattle, Feb. 21, 2002 [PR]

A. Züttel, P. Wegner, S. Rentsch, P. Sudan, P. Mauron, C. Emmenegger, L. Schlapbach: “Hydrogen Desprption from Lithiumtetrahydroboride ($LiBH_4$)”, Proceedings 14th World Hydrogen Energy Conference, Montreal, June 9-13, 2002 [PR+PU]

P. Sudan, A. Züttel, P. Wegner, C. Emmenegger, P. Mauron, L. Schlapbach: “Carbon Nanostructures as Hydrogen Storage Material”, 14th World Hydrogen Energy Conference, Montreal, June 9-13, 2002 [PR]

P. Mauron, Ch. Emmenegger, A. Züttel, Ch. Nützenadel, P. Sudan, L. Schlapbach, “Synthesis of Oriented Nanotube Films by Chemical Vapor Deposition”, Carbon **8** (2002) 1339-1344 [PU]

A. Züttel, S. Orimo: “Hydrogen in Nanostructured, Carbon-Related, and Metallic Materials”, MRS Bulletin, **27**, No.9 (Sept. 2002) 705-711 [PU]

L. Schlapbach, A. Züttel: “Ways to Hydrogen Technology: The Materials Science Approach”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

P. Sudan, P. Wegner, P. Mauron, C. Emmenegger, A. Züttel: “Hydrogen Sorption in Metal Hydride – Carbon Nanotube Composites”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

A. Züttel, P. Wegner, S. Rentsch, P. Sudan, P. Mauron, C. Emmenegger: “Hydrogen Desorption from $LiBH_4$”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

A. Züttel, P. Wenger, S. Rentsch, P. Sudan, Ph. Mauron, Ch. Emmenegger: "$LiBH_4$ A NEW HYDROGEN STORAGE MATERIAL", J. of Power Sources (2002), submitted [PU]

A. Züttel, S. Rentsch, P. Wenger, P. Sudan, Ph. Mauron, Ch. Emmenegger: "HYDROGEN STORAGE MATERIALS: METALS, CARBON AND COMPLEXES", 11th International Symposium on Processing and Fabrication of Advanced Materials, J. of Power Sources, in press [PR+PU]

A. Züttel: “Hydrogen Storage for Mobile applications“, invited seminar, IFW Dresden, 1 Mar. 2002 [PR]

A. Züttel: “Hydrogen Storage Materials: a Survey“, invited talk, Max Planck Gesellschaft, Schloss Ringberg Tegernsee, “Hydrogen Ionic, Atomic and Molecular Motion“, 7 Mar. 2002 [PR]

A. Züttel: “Hydrogen Storage Materials“, invited seminar, Université de Laval, Quebec, Canada, 17 Jun. 2002 [PR]

A. Züttel: “Carbon Nanotubes: Synthesis, Properties and Applications“, invited talk, 17th One-Day-Symposium, Electrochemistry, PSI-West, Villigen, Switzerland, 11 Sep. 2002 [PR]

A. Züttel: “Carbon Nanotubes for Electrochemical Double Layer Capacitor”, Kickoff Meeting, Top Nano 21 Project, HTL Luzern, Horw, Switzerland, 13 Sep. 2002 [PR]

A. Züttel: “Hydrogen Storage Materials: Possibilities and Limitations“, invited seminar, Vrije Universiteit Van Amsterdam, The Netherlands, 23 Sep. 2002 [PR]

A. Züttel: “Hydrogen Storage Materials“, invited seminar, TU Delft, 24 Sep. 2002 [PR]

A. Züttel: “Hydrogen in carbon nanostructures: characterization, analyzing techniques, results and interpretation “, invited talk, Workshop "Hydrogen Storage in Carbon Nanotubes: State of the Art", Sophia-Antipolis 9 Oct. 2002 [PR]

A. Züttel: “Hydrogen Storage Materials: Metals, Carbon and Complexes“, invited seminar, Max Planck Institut für Metallforschung (IFM) Stuttgart, 5 Nov. 2002 [PR]

A. Züttel, S. Rentsch, P. Fischer, P. Wegner, P. Sudan, Ph. Mauron, Ch. Emmenegger: “$LiBH_4$ a new hydrogen storage material”, J. of Power Sources, **118** (2003) 1-7 [PU]

A. Züttel, P. Wegner, S. Rentsch, P. Sudan, Ph. Mauron, Ch. Emmenegger: “Hydrogen storage properties of $LiBH_4$”, J. Alloys and Compounds, **357-357** (2003) 515-520

A. Züttel: "Materials for Hydrogen Storage", Materials Today, Sept. 2003, pp. 24-33.

Project HC-6. FUCHSIA: Fuel cell and hydrogen store for integration into automobiles (J. Speight [UK])

No data available.

Project HC-7. Development and characterization of advanced materials for hydrogen storage (M.A. Imam [USA])

M.A. Imam, R.O. Loutfy: "Hydrogen Absorption Capacity of Different Types of Carbon Nanotube", Proceedings of NANOTUBE 2001, IInd International Workshop on the Science and Application of Nanotubes , July 2001, Potsdam, Germany [PR+PU]

M.A. Imam, N.E. Tran, S.J. Gill, J.R. Feng: “Evaluation of Hydrogen Storage Characteristics of Misch Metal Based Alloys, Proceedings of PRICM IV, Dec 2001, pp.2913-2916 [PR+PU]

N.E. Tran, J.R. Feng, S.E. Kooi, M. Ashraf Imam: "Defect Density of Single-Walled Carbon Nanotubes Synthesized by Various Techniques”, International Conference on the Science and Applications of Nanotubes (NT02), July 6-11, 2002, Boston, MA [PR]

N.E. Tran, J.R. Feng, M.A. Imam: “Hydrogen Storage Capacity of Single Walled Carbon Nanotubes Synthesized by Various techniques”, Proceedings 2nd IEEE-Nano Conference, August 2002, Washington DC, pp. 397-399 [PR+PU]

N.E. Tran, C.R. Feng,, M. Ashraf Imam: “Spectroscopic Characterization of Different Types of Defects in Single-Walled Carbon Nanotubes”, to be presented at the TMS Annual meeting, March 2003, in San Diego, CA [PR]

Project HC-8. Engineering properties of new storage materials (D. Dedrick [USA])

G. Sandrock, K. Gross, G. Thomas, C. Jensen, D. Meeker, S. Takara: “Engineering considerations in the use of catalyzed sodium alanates for hydrogen storage”, J. Alloys and Compounds, **330-332** (2002) 696-701 [PR+PU]

G.J. Thomas, G. Sandrock, K.J. Gross: “Engineering Properties of Complex Hydrides”, TMS2002, The Minerals, Metals & Materials Society, Seattle, Feb. 21, 2002 [PR]

G. Sandrock, K. Gross, G. Thomas: “Effect of Ti-catalyst content on the reversible hydrogen storage properties of the sodium alanates”, J. Alloys and Compounds, **339** (2002) 299-308 [PU]

Project HC-9. Hydrogen in hydrides, carbon and zeolites (K. Ross [UK])

M. Kemali, J.E. Totelici, D.K. Ross, I. Morrison: “Inelastic neutron scattering measurements and ab initio calculations of hydrogen in single crystal palladium”, Phys. Rev. Letts., **84** (2000) 1531 [PU]

P. Albers, M. Poniatowski, S.F. Parker, D.K. Ross: “An Inelastic Neutron Scattering Study on Different Grades of Palladium of varying pretreatment”, J. Phys. Condens. Matter, **12** (2000) 4451-4463 [PU]

D. Sun, F. Gingl, H. Enoki, D.K. Ross, E. Akiba: “Phase components of the sintered Mg-X WT% $LaNi_5$ (X= 20-50) composites and their hydrogenation properties”, Acta Mater., **48** (2000) 2363-2372 [PU]

D.J. Bull, D.K. Ross: “Monte Carlo simulations of quasi-elastic neutron scattering from lattice gas systems”, Physica B, **301** (2001) 54-58 [PU]

P. Albers, A. Karl, J. Mathias, D.K. Ross, S.F. Parker: “INS- XPS- and SIMS- investigations on the controlled post-oxidation of pigment blacks: Detection of different species of strongly adsorbed water”, Carbon, **39** (2001) 1663-1676 [PU]

D.K. Ross, J.E. Totolici, M. Kemali, I. Morrison, M. Johnson: “Proton wave functions in palladium studied by ab initio calculations and inelastic neutron scattering methods”, Recent Advances in Hydride Chemistry, Elsevier (2002) Chapter 17 [PU]

P.W. Albers, S. Bosing, H.L. Rotgerink, D.K. Ross, S.F. Parker: “Inelastic neutron scattering study on the influence of after-treatments on different technical cokes of varying impurity level and their sp(2)/sp(3) character”, Carbon **40** (2002) 1549-1558 [PU]

J. Liu, D.P. Broom, P.A.L. Georgiev, D.K. Ross: “Magnetic properties of the YCo_3-H system”, J. Alloys and Compounds, **356** (2003) 174-177 [PU]

D.J. Bull, D.P. Broom, D.K. Ross**:** “Monte Carlo simulation of quasielastic neutron scattering from localised and long-range hydrogen motion in C15 Laves phase intermetallic compounds”, Chem. Phys., **292** (2003) 153-160 [PU]

P.A. Georgiev, J. Liu, D.K. Ross, K.H. Andersen, A. Otto: “An in situ neutron time-of-flight diffraction study of $LaMM(NiCoAlMn)_{(5-x)}$ battery electrode materials and their deuterides, for x=0 and x=0.2”, J. Alloys and Compounds, **349** (2003) 325-333 [PU]

Project HC-10. Fabrication of Hydrogen Storage Alloys and Composites Employing Vapor Deposition Technologies (D. Milcius [Lithuania])

G. Thomas, L. Pranevicius, D. Milcius, L. L. Pranevicius: “Plasma hydriding of aluminum and magnesium thin films for hydrogen storage applications”, Proceedings III Intern. Symposium “New Electrical and Electronic Technologies”, Zakopane, Poland, 2003 [PR+PU]

L. Pranevicius, D. Milcius, L.L. Pranevicius, V. Sirvinskait, J. Nomgaudyte, J.-P. Riviere, C. Templier: “Mass-transport driven by surface instabilities in metals under reactive plasma/ion beam treatment at moderate temperature”, Central European Journal of Physics, 2003, in press [PU]

L. Pranevicius, D. Milcius, L.L. Pranevicius, G. Thomas: “Plasma hydrogenation of Al, Mg and MgAl films under high-flux ion irradiation at elevated temperature”, J. Alloys and Compounds, (2003), in press [PU]

D. Milcius, L.L. Pranevicius, J. Nomgaudyte, I. Barnackas: “Behavior of hydrogen in Al, Mg and AlMg plasma saturated films”, Solid State Phenomena (2003), in press [PU]

Project HC-11. Hydrogen storage in microspheres (M. Lang [Norway])

M. Herr, J.A. Lercher: “Hydrogen Storage in Microspheres”, Final Report for ESA Contract 16292/02/NL/PA, ET EnergieTechnologies, Sept. 10, 2003 [PU]

Project HC-12. Electronic design and mechanicochemical synthesis of new hydrogen storage materials (Z.X. Guo [UK])

New project for 2004-2006 Task Extension. See Project H-12.

Project HC-13. Relationship between structure and hydrogen absorption characteristics (E. Gray [Australia])

Tentative new project for 2004-2006 Task Extension.

Project HC-14. Hydrogen storage in metals, molecular compounds, and nanostructured materials (A. Albinati, R. Cantelli [Italy])

New project incorporated in late 2003.

A. Paolone, R. Cantelli, S. Roth, U. Dettlaff: “Elastic modulus and relaxation processes in carbon nanotubes”, Meeting of the National Network on Nanostructured Carbon and Nanotubes (Milano, Italy, 2003) [PR]

A. Paolone, R. Cantelli, S. Roth, U. Dettlaff: “Dynamics of highly mobile species and influence of defects an impurities on the elastic modulus and energy loss in carbon nanotubes”, Gordon Research conference on Hydrogen-Metal Systems, Waterville, USA, 2003 [PR]

A. Albinati: Structure and Dynamics of Metallic Hydrides: from Molecular Compounds to Nanostructured Materials”, 7th ICCOM Lecture: CNR, Florence (2003) [PR]

A. Albinati: “X-ray Diffraction and Neutron Scattering to Probe the Structure and Dynamics of Metal Hydrides”, Invited Colloquium, Chemistry Department, ETH Zürich (2003) [PR]

Project HC-15. Performance characterisation of solid-state hydrogen storage materials (C. Filiou [EC])

New project for 2004-2006 Task Extension.

Hydride Projects

Project H-1. IEA/DOE/SNL on-line hydride databases (G. Sandrock [USA])

G. Sandrock. G. Thomas: “The IEA/DOE/SNL on-line hydride databases”, Appl. Phys. A, **72** (2001) 153-155 [PU]

G. Sandrock: “Metal Hydride Overview”, Hydrogen Storage Workshop Gateway to Energy Security, Hilton Head, SC, Feb. 27 – Mar. 1, 2002, Savannah River Technology Center [PR]

G. Sandrock: “Problems and Progress with Rechargeable Metal Hydrides”, Fuel Cell Catalyst, **2** (No.2, Winter 2002) 3 [PU]

C. Elam, C.E. Gregoire Padro, G. Sandrock, A. Luzzi, P. Lindblad, E.F. Hagen: "Realizing the Hydrogen Future: International Collaborations to Advance Hydrogen Energy Technologies", Proceedings 14th World Hydrogen Energy Conference, Montreal, June 9-13, 2002 [PR+PU]

B. Bogdanovic', G. Sandrock: "Catalyzed Complex Hydrides", MRS Bulletin, **27**, No.9 (Sept. 2002) 712-716 [PU]

G. Sandrock: "Hydrogen Storage R&D in the IEA Hydrogen Implementing Agreement", Proceedings of the National Hydrogen Association's 14th Annual U.S. Hydrogen Conference, March 3-6, 2003, NHA, Washington, DC [PR+PU]

G. Sandrock: "Hydrogen Storage", The Hydrogen Future, ASM International Oak Ridge Chapter, Oak Ridge, TN, March 27, 2003 [PR]

G. Sandrock: "Hydride Storage", Handbook of Fuel Cell Technology, W. Vielstich, A. Lamm and H. Gasteiger, Eds., Volume 3, Part 2, John Wiley & Sons, (March, 2003) pp. 101-112 [PU]

G. Sandrock, R.C. Bowman, Jr.: "Gas-Based Hydride Applications: Recent Progress and Future Needs", International Symposium on Metal Hydrogen Systems (MH2002), J. Alloys and Compounds, 356-357 (2003) 794-799 [PR+PU]

G. Sandrock: "Onboard Hydrogen Storage" and "Hydride Applications", Staff Seminars, UOP Research Center, Des Plaines, IL, April 14, 2003 [PR]

G. Sandrock: "Hydrogen Energy: A Role for Metal Hydrides", Materials Science and Engineering Colloquium, Case Western Reserve University, Cleveland, OH, April 15, 2003 [PR]

G. Sandrock: "Onboard Hydrogen Storage" and "Metal Hydride Technology" and "Hydride Applications", Staff Seminars, GE Global Research Center, Niskayuna, NY, May 6, 2003 [PR]

G. Sandrock: "Onboard Hydrogen Storage" and "Metal Hydride Technology" and "Hydride Applications", Staff Seminars, Lithuanian Energy Institute, Kaunas, May 6, 2003 [PR]

C.C. Elam, C.E. Gregoire Padro, G. Sandrock, A. Luzzi, P. Lindblad, E.F. Hagen: "Realizing the hydrogen future: the International Energy Agency's efforts to advance hydrogen energy technologies", Int. J. Hydrogen Energy, **28** (2003) 601-607 [PR+PU]

G. Sandrock: "Introduction to Metal Hydrides for H-Storage and Other Applications", Science & Technology for the Hydrogen Economy, DuPont Chesapeake Farms, MD, Oct. 27-30, 2003

R.C. Bowman, Jr., G. Sandrock: "Metal Hydrides for Energy Storage and Conversion Applications", Hydrogen Storage Session, ANS/ENS 2003 Winter Meeting, New Orleans, LA, Nov. 19, 2003 [PR]

Project H-2. Real time synchrotron studies of hydrides (J. Huot [Canada])

Project no longer active.

J.F. Pelletier, J. Huot, M. Sutton, R. Schulz, A.R. Sandy, L.B. Lurio, G.J. Mochrie: Phys. Rev. B, **63** (2001) 52103 [PU]

J. Huot, J.F. Pelletier, G. Liang, M. Sutton, R. Schulz: “Structure of nanocomposite metal hydrides”, J. Alloys and Compounds, **330-332** (2002) 727-731 [PR+PU]

Project H-3. Alkaline borohydride solutions as H-generation system (S. Suda [Japan])

S. Suda: “Metal-Hydrogen Complex Ions as High H-Capacity Storage Materials and their Application to Fuel Cells”, 10th Canadian Hydrogen Conf., Quebec, Canada, May 28-31, 2000 [PR]

S. Suda, Y. -M. Sun, M. Uchida, B. -H. Liu, S. Morimitsu, K. Arai, Y. Zhou, N. Tsukamoto, Y. Candra, Z. -P. Li: "Fluorinated Metal Hydrides for the Catalytic Hydrolysis of Metal-Hydrogen Complexes", 2nd KIM-JIM Joint Symposium on Hydrogen Absorbing Materials, Seoul, Korea, October 27, 2000 [PR]

S. Suda, K. Arai, S. Morimitsu, Y. -M. Sun, B. -H. Liu, N. Tsukamoto, M. Uchida, Y. Candra, Z. -P. Li: “Catalytic Functions of Metal Hydrides in the Hydrolysis and Production of B-based Hydrogen-Metal Complexes as the Hydrogen Storage Materials”, 6th Int. Symposium on Electrochemical/Chemical Reactivity of Amorphous and Nanocrystalline Materials, Mont-Tremblant Quebec, Canada, February 7-9, 2001 [PR]

S. Suda: “Borohydrides as hydrogen storage and generation materials”, The 3rd Nagoya Hydrogen Symposium, Industrial Trade Center, Aichi, March 19, 2001 [PR]

S. Suda, Y. -M. Sun, M. Uchida, B. -H. Liu, S. Morimitsu, K. Arai, Y. Zhou, N. Tsukamoto, Y. Candra, Z. -P. Li: "Fluorinated Metal Hydrides for the Catalytic Hydrolysis of Metal-Hydrogen Complexes", Metals and Materials International**, 7**(1) (2001), pp. 73-75 [PU]

S. Suda, Y. -M. Sun, B. -H. Liu, Y. Zhou, S. Morimitsu, K. Arai, N. Tsukamoto, M. Uchida, Y. Candra, Z. -P. Li, "Catalytic Generation of Hydrogen by Applying Fluorinated-Metal Hydrides as Catalysts", J. Applied Physics A**, 72** (2001) 209-212

S. Suda: “Micro-Fuel Cells”, MATERIAL STAGE, **1**(7) (2001), 14-17 [PU]

S. Suda: “Development of a compact fuel cell”, Fuel Cells (Information Center for the Development of Fuel Cells), **1** (2), (October 2001), 39-41 [PU]

S. Suda: “Borohydride as the hydrogen storage material and its recycling process”, The 4th meeting of MHRDS, Osaka Gas Ind., Osaka, Feb. 15, 2002 [PR]

S. Suda: “Liquid-hydride fuel for PEMFC”, Fuel Cells (Information Center for the Development of Fuel Cells), **1**(4) (April 2002), 23-26 [PU]

S. Suda: “Hydrogen supply by using sodium borohydride as the hydrogen storage material”, METALS (AGUNE Technology Center), **72**(5) (2002), 33-40 [PU]

S. Suda: “Development of Direct Borohydride Fuel Cell (DBFC) – Recent advancements of the micro-fuel cells for mobile applications”, Sogohgijyutu Center, Mechanical Promotion Center, Tokyo, April 17, 2002 [PR]

S. Suda: “Recent advancements in borohydride R&D and its practicability – What is the realistic hydrogen storage technology for FCV?”, Automotive Technology/J. Nikkei Mechanical, (Ohtemachi-Nikkei Hall, Tokyo), May, 14, 2002 [PR]

S. Suda, Z.-P. Li: An Electrochemical Application of Protide (H^-) in Liquid Borohydride Solutions as the Hydrogen storage Material”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

S. Suda et al: “Production of $NaBH_4$ by a Mechano-chemical Treatment of Fluorinated-MgH_2 with the Mixture of $NaBO_2$ and NaOH”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

S. Suda: "Chemical Hydride Storage Devices: Aqueous Borohydride Solutions”, **Handbook of Fuel Cell Technology**, W. Vielstich, A. Lamm and H. Gasteiger, Eds., Volume 3, Part 2 (Fuel Cell Technology and Applications), John Wiley & Sons, (March, 2003) [PU]

Z.P. Li, B.H. Liu, K. Arai, K. Asaba, S. Suda: “Evaluation of alkaline borohydride solutions as the fuel for fuel cell”, J. Power Sources (in press) [PU]

Z.P. Li, B.H. Liu, K. Arai, S. Suda: “A fuel cell development for using borohydrides as the fuel”, J. Electrochem. Soc., **150** (2003) A868-872 [PU]

Z.P. Li, B.H. Liu, K. Arai, S. Suda: “A Micro fuel cell using borohydride as the fuel”, Power MEMS, Sep. 2003 (in press) [PU]

B.H. Liu, Z.P. Li, S. Suda: **“**Anodic Oxidation of Alkali Borohydrides Catalyzed by Nickel**”,** J. Electrochem. Soc., **150** (2003) A398-402 [PU]

Z.P. Li, B.H. Liu, N. Morigasaki, S. Suda: “Preparation of potassium borohydride by a mechano-chemical reaction of saline hydrides with dehydrated borate through ball milling”, J. Alloys and Compounds, **354** (2003) 243-247 [PU]

S. Suda, B.-H. Liu, Y. Iwase, K. Mori, Y. Sun, K. Arai, M. Yoshimori, Z.-P. Li: “Production of $NaBH_4$ by a Mechano-chemical Treatment of Fluorinated-MgH_2 mixing with $NaBO_2$”, J. Alloys and Compounds, (in press) [PU]

S. Suda, B.-H. Liu, K. Arai, Y.-M. Sun, K. Mori, M. Yoshimori, Z.-P. Li: “An Electrochemical Application of Protide (H^-) in Liquid Borohydride Solutions as the Hydrogen Storage Material”, J. Alloys and Compounds, (in press) [PU]

Z.P. Li, B. H. Liu, K. Arai, N. Morigasaki, S. Suda: “Protide compounds in hydrogen storage systems”, J. Alloys and Compounds, **356-357**(2003) 469-474 [PU]

Z.P. Li, B.H. Liu, N. Morigasaki, S. Suda: “Preparation of sodium borohydride by the reaction of MgH_2 with dehydrated borax through ball milling at room temperature”, J. Alloys and Compounds, **349** (2003) 232-236 [PU]

Project H-4. Zintl phase hydrogen absorbing compounds (E. Akiba [Japan])

F. Gingl, T. Vogt, E. Akiba: “Trigonal $SrAl_2H_2$: the first Zintl phase hydride”, J. Alloys and Compounds, **306** (2000) 127-132 [PU].

Q.A. Zhang, H. Enoki, E. Akiba: "Phase relations and hydrogenation behavior of $Sr_{1-x}Ca_xAl_2$ ($0 \leq x \leq 1$)", J. Alloys and Compounds, **322** (2001) 257-264 [PU]

Q. A. Zhang, H. Enoki, E. Akiba: "Hydrogenation behavior and crystal structure of $Sr_{1-x}Ca_xAl_2$", Spring Meeting of Japan Institute of Metals, Chiba, Japan, 28-30 March 2001 [PR]

Q.A. Zhang, F. Gingl, H. Enoki, E. Akiba: "Hydrogenation behavior of Zintl compound $SrAl_2$", The 5th International Conference on New Energy Systems and Conversions, Shanghai, China, 22-25 August 2001 [PR]

Q.A. Zhang, H. Enoki, E. Akiba: "Phase relations and hydrogenation behavior of $Sr_{1-x}Ba_xAl_2$ ($0 \leq x \leq 0.5$)", J. Alloys and Compounds, **327** (2002) 136-142 [PU]

E. Akiba, H. Enoki, Y. Nakamura: "Crystal structural studies of AB_5-type, BCC and Zintl phase hydrogen absorbing alloys", Materials Science and Engineering, **A329-331** (2002) 321-324 [PU]

Q. A. Zhang, Y. Nakamura, K. Oikawa, T. Kamiyama, E. Akiba: "Synthesis and crystal structure of Sr_2AlH_7: A new structural type of alkaline earth aluminum hydride", Inorg. Chem. **41** (2002) 6547-6849 [PU]

Q. A. Zhang, Y. Nakamura, K. Oikawa, T. Kamiyama, E. Akiba: "New alkaline earth aluminum hydride with one-dimensional zigzag chains of $[AlH_6]$: Synthesis and crystal structure of $BaAlH_5$", Inorg. Chem. **41** (2002) 6941-6943 [PU]

Q. A. Zhang, Y. Nakamura, E. Akiba: "Hydrogenation behavior of Ba_7Al_{13} and the structure of $BaAlH_5$", International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

Q. A. Zhang, H. Enoki, E. Akiba: "Hydrogenation Behavior of Zintl Compound $SrAl_2$", Fall Meeting of Japan Institute of Metals, Osaka, Japan, 2-4 November 2002 [PR]

E. Akiba, Q. A. Zhang, Y. Nakamura: "Novel hydrides with [Al-H] bonding synthesized by hydrogenation of alloys consisted of alkali earth and aluminum", Gordon Research Conferences, Hydrogen-Metal Systems, Waterville, Maine, USA, 13-18 July 2003 [PR]

Q.A. Zhang, E. Akiba: "Phase relations and hydrogenation behavior of $Sr(Al_{1-x}Mg_x)_2$", J. Alloys and Compounds, **360** (2003) 143-150 [PU]

Q. A. Zhang, Y. Nakamura, K. Oikawa, T. Kamiyama, E. Akiba: "Hydrogen-induced phase decomposition of Ba_7Al_{13} and the crystal structure of Ba_2AlH_7", J. Alloys and Compounds, **361** (2003) 180-186 [PU]

E. Akiba, H. Enoki, Y. Nakamura: "Hydrogen absorbing materials and novel metal hydrides", Japanese Patent No. 3416727 (2003) [PA].

Project H-5. Research of new X-TM-Y alloys (X=Ca, Mg, Li; TM=transition metals; Y=metals) (N. Kuriyama [Japan])

H. T. Takeshita, T. Oishi, N. Kuriyama: "Disproportionation of $CaNi_3$ hydride: formation of a new hydride, $CaNiH_3$", J. Alloys and Compounds, **333** (2002) 266-273 [PU]

H. T. Takeshita, Y. Sakamoto, T. Oishi, N. Takeichi, T. Kiyobayashi, H. Tanaka, N. Kuriyama, H. Senoh: "Research on New Ca-Ni Based Alloys for Hydrogen Storage", TMS2002, The Minerals, Metals & Materials Society, Seattle, Feb. 21, 2002 [PR]

H. T. Takeshita, Y. Sakamoto, H. Tanaka, N. Takeichi, T. Kiyobayashi, H. Senoh: "Hydrogenation Property of $CaPd_2$: Exception to HIA Criterion?", International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

H. T. Takeshita, Y. Sakamoto, N. Takeichi, T. Kiyobayashi, H. Tanaka, N. Kuriyama, H. Senoh: "Synthesis of $CaNi_{1-x}Pd_x$ ($0.1<x<1$) alloys and hydrogenation properties of CaPd", J. Alloys and Compounds, **347** (2002) 231-238 [PU]

H. T. Takeshita, T. Furuya, H. Miyamura, N. Kuriyama, "Synthesis of $CaNiH_3$ based hydrides by mechanical alloying", International Conference on Advanced Materials 2003 (IUMRS-ICAM2003), Symposium C-1 Ecomaterials, Yokohama, Japan, 8-10 October 2003 [PR]

Project H-6. Nonconventional hydrides with low H-H separations (V. Yartys [Norway])

R.V. Denys, V.A. Yartys, A.B. Riabov: **"**Thermodynamic studies and crystal chemical analysis of the RENiIn-based (RE = Ce, Pr, Nd) hydrides", VII International Conference on Hydrogen Materials Science and Chemistry of Metal Hydrides, Ukraine, 2001 [PR]

V.A.Yartys: **"**Hydrogen storage: an overview", Materials Congress 2002, 9-11 April 2002. London, Invited lecture [PR]

V.A. Yartys, R.V. Denys, B.C. Hauback, H. Fjellvåg, I.I. Bulyk, A.B. Riabov, Ya.M. Kalychak: "Short hydrogen-hydrogen separations in novel intermetallic hydrides, $RE_3Ni_3In_3D_4$ (RE=La, Ce and Nd)", J. Alloys and Compounds, **330-332** (2002) 132-140 [PR+PU]

M.V. Lototsky, V.A. Yartys, V.S. Marinin, N.M. Lototsky: "Modelling of phase equilibria in the metal-hydrogen systems", J. Alloys and Compounds, **356-357** (2003) 27-31 [PR+PU]

V.A. Yartys, O. Isnard, A.B.Riabov. L.G. Akselrud: "Unusual effects of hydrogenation: anomalous expansion and volume contractions", J. Alloys and Compounds, **356-357** (2003) 109-113 [PR+PU]

M. Stange, V.A. Yartys, J.P. Mæhlen, M. Hanfland" "High pressure synchrotron XRD study of the pressure induced structural changes in $LaNiInD_{1.3}$", J. Alloys and Compounds, **356-357** (2003) 395-399 [PR+PU]

A.B. Riabov, V.A. Yartys, R.V. Denys, B.C. Hauback: "$Zr_4Al_3D_{2.7}$ and $Zr_3Al_2D_{2.2}$: new Zr-containing internetallic hydrides with ordered hydrogen sublattice", J. Alloys and Compounds, **356-357** (2003) 91-95 [PR+PU]

J.P. Maehlen, V.A. Yartys, B.C. Hauback: "Structural studies of deuterides of rare earth metal carbide systems", J. Alloys and Compounds, **356-357** (2003) 475-479 [PR+PU]

P. Vajeeston, P. Ravindran, R.Vidya, A.Kjekshus, H.Fjellvåg, V.A.Yartys: "Short hydrogen-hydrogen separation in $RNiInH_{1.333}$", Physical Review B, in press [PU]

R.V. Denys, A.B. Riabov, V.A.Yartys, B.C. Hauback, H.W.Brinks: “In situ neutron diffraction study of $LaNiInD_{1.63}$ with short D…D distances”, J. Alloys and Compounds, **356-357** (2003) 65-68 [PR+PU]

V.A. Yartys, F.R. de Boer, K.H.J. Buschow, B. Ouladdiaf, H.W. Brinks, B.C. Hauback: “Crystallographic and magnetic structure of $Pr_6Fe_{13}AuD_{13}$”, J. Alloys and Compounds, **356-357** (2003) 142-146 [PR+PU]

V.A. Yartys, B. Ouladdiaf, O. Isnard, O.Yu. Khyzhun, K.H.J. Buschow: “Hydrogen induced antiferromagnetism in the Kondo semimetal CeNiSn”, J. Alloys and Compounds, **359** (2003) 62-65 [PU]

Project H-7. Destabilisation of hydrides based on hydrido complexes (D. Noréus [Sweden])

M. Olofsson-Mårtensson, M. Kritikos, D. Noréus: “A Novel Tetrahedral Formally Zerovalent-Palladium Hydrido Complex Stabilized by Divalent Alkaline Earth Counterions”, J. Am. Chem. Soc., **121** (1999) 10908-10912 [PU]

M. Olofsson-Mårtensson, U. Häussermann, J. Tomkinson, D. Noréus: “Stabilization of Electron-Dense Palladium-Hydrido Complexes in Solid State Hydrides”, J. Am. Chem. Soc., **122** (2000) 6960-6970 [PU]

H. Blomqvist, E. Rönnebro, D. Noréus, T. Kuji: “Competing stabilization mechanisms in Mg_2NiH_4”, J. Alloys and Compounds, **330-332** (2002) 268-270 [PU]

H. Blomqvst, D. Noréus: "Mechanically reversible conductor-insulator transition in Mg_2NiH_4", J. Appl. Phys. **91** (2002) 5141-5148 [PU]

U. Haussermann, H. Blomqvst, D. Noréus: "Bonding and stability of the hydrogen storage material Mg_2NiH_4", Inorg. Chem. **41** (2002) 3684-3692 [PU]

H. Blomqvst, D. Noréus: "A Mechanically Reversible Conductor-Insulator Transition in Mg_2NiH_4", International Symposium on Metal Hydrogen Systems, Annecy, France, 1-6 September 2002 [PR]

H. Blomqvist, E. Rönnebro, D. Kyoi, T. Sakai, D. Noréus: "Structural characterization of $Mg_3MnH_{\sim 6}$ - a new high pressure phase synthesized in a multi anvil cell at 6 GPa", J. Alloys and Compounds, **358** (2003) 82-86 [PU]

K. Kadir, D. Noréus, I. Yamashita: ” Structural determination of $AmgNi_4$ (where A=Ca, La, Ce, Pr, Nd and Y) in the $AuBe_5$ type structure” J. Alloys and Compounds, **345** (2002) 140-143 [PU]

T. Sato, H. Blomqvist, D. Noréus, “Attempts to improve Mg_2Ni hydrogen storage by aluminium addition” J. Alloys and Compounds, **356** (2003) 494-496 [PU]

H. Blomqvist, D. Noréus D, O. Babushkin, F. Nion, E. Vuorinen, ” Structure and resistivity correlations in Mg_2NiH_4 studied with in situ X-ray diffraction” J. Mater. Sci. Let., **22** (2003) 1487-1489 [PU]

H. Blomqvist, E. Rönnebro, D. Kyoi, T. Sakai, D. Noréus: "Structural characterization of $Mg_3CrH_{\sim 6}$—a new high-pressure phase synthesized in a multi-anvil cell at 8 GPa", J. Alloys and Compounds, in press [PU]

Project H-8. Destabilization of metal hydride complexes and theoretical modeling (K. Yvon [Switzerland])

H. Kohlmann, H.E. Fischer, K. Yvon: "Europium Palladium Hydrides", Inorganic Chem., **40** (2001) 2608-2613 [PU]

K. Yvon, H. Kohlmann, B. Bertheville: "Europium-hydrogen Bond Distances in Saline Metal Hydrides by Neutron Diffraction", Chimica, **55** [No.5] (2001) 505-509 [PU]

H. Kohlmann, B. Bertheville, P. Fischer, K. Yvon: "High pressure synthesis of novel europium magnesium hydrides", J. Alloys and Compounds, **322** (2001) 59-68 [PU]

B. Bertheville, T. Herrmannsdörfer, K. Yvon: "Structure data for K_2MgH_4 and Rb_2CaH_4 and comparison with hydride and fluoride analogs", J. Alloys and Compounds, **325** (2001) L13-L16 [PU]

B. Bertheville, P. Fischer, K. Yvon: "High pressure synthesis and crystal structures of new ternary magnesium hydrides, $CsMgH_3$, $Cs_4Mg_3H_{10}$ and Cs_2MgH_4", J. Alloys and Compounds, **330-332** (2002) 152-156 [PR+PU]

R. Cerny, J.-M. Joubert, H. Kohlmann and K. Yvon: "$Mg_6Ir_2H_{11}$, a New Metal Hydride Containing Saddle-like $[IrH_4]^{5-}$ and Square-Pyramidal $[IrH_5]^{4-}$ Hydrido Complexes", J. Alloys and Compounds, **340** (2002) 180-188 [PU]

J-Ph. Soulié, G. Renaudin, R. Cerny, K. Yvon: "Lithium Boro-Hydride $LiBH_4$: I. Crystal Structure", J. Alloys and Compounds, **346** (2002) 200-205 [PU]

S. Gomes, H. Hagemann, K. Yvon: "Lithium Boro-Hydride $LiBH_4$: II. Raman Spectroscopy", J. Alloys and Compounds, **346** (2002) 206-210 [PU]

K. Yvon: "Metal Hydrides Hold the Key to Green Energy", Highlights of ILL Research, Neutrons and new materials, Ed. N. Hall, Institute Laue Langevin, May 2002, p. 9 [PU]

L. Guénée: "Etude Cristallochimique des Composés Intermétalliques de Stoechiométrie AB_5 et de leurs Propriétés à Absorber l'Hydrogène", Thesis N° 3341, Université de Genève, (2002) [PU]

S.F. Parker, K.P.J. Williams, T. Smith, M. Bortz, B. Bertheville, K. Yvon: "Vibrational Spectroscopy of Tetrahedral Ternary Metal Hydrides: Mg_2NiH_4, Rb_3ZnH_5 and their Deuterides" Phys. Chem. Chem. Phys., **4** (2002) 1732-1737 [PU]

K. Yvon: "Metal-Hydrogen Complex Formation in Hydrogenated Intermetallic Compounds", Swiss Neutron News, **22** (2002) 11-16

K. Yvon, L. Guénée: "Structure Stability Maps for AB_5 Type Compounds", International Symposium on Metal Hydrogen Systems (MH2002), J. Alloys and Compounds, **356-357** (2003) 114-119 [PR+PU]

Y.E. Filinchuk, D. Sheptyakov, G. Hilscher, K. Yvon : "Hydrogenation induced valence change and metal atom site exchange at room temperature in the C14-type sub-structure of $CeMn_{1.8}Al_{0.2}H_{4.4}$ " International Symposium on Metal Hydrogen Systems (MH2002), J. Alloys and Compounds, **356-357** (2003) 673-678 [PR+PU]

L. Guénée, V. Favre-Nicolin, K. Yvon: "Synthesis, Crystal Structure and Hydrogenation Properties of the Ternary Compounds $LaNi_4Mg$ and $NdNi_4Mg$", J. Alloys and Compounds, **348** (2003) 129-137 [PU]

L. Guénée, K. Yvon: "Synthesis, Crystal Structure and Hydrogenation Properties of the Novel Metal Compound $LaNi_2Mn_3$", J. Alloys and Compounds, **348** (2003) 176-183 [PU]

G. Renaudin, L. Guénée, K. Yvon : "$LaMg_2NiH_7$, a Novel Quaternary Metal Hydride Containing Tetrahedral $[NiH_4]^{4-}$ Complexes and Hydride Anions". J. Alloys and Compounds, **350** (2003) 145-150 [PU]

L. Guénée, V. Favre-Nicolin, K. Yvon: "Synthesis, Crystal Structure and Hydrogenation Properties of the Ternary Compounds $LaNi_4Mg$ and $NdNi_4Mg$", J. Alloys and Compounds **348** (2003) 129-137 [PU]

K. Yvon : "Hydrogen in Novel Solid State Metal Hydrides". Z. Kristallogr. **218** (2003) 108-116 [PU]

H. Hagemann, S. Gomes, G. Renaudin, K. Yvon: "Raman Studies of Reorientation Motion of $(BH_4)^-$ Anions in Alkali Borohydrides", *J. of Alloys and Compounds*, in press [PU]

K. Yvon: "Metal Hydrides: Transition Metal Hydride Complexes", Encycl. Mater. Sci. Technol.-Updates, in press [PU]

Project H-9. Thermal hydrogen compression with purification (D. DaCosta [USA])

D. DaCosta, M. Golben: "Disproportionation Resistant Alloy Development for Hydride Hydrogen Compression", Proceedings of the 2002 U.S. DOE Hydrogen and Fuel Cells Program Annual Program/Lab R&D Review, Golden, May 6-10, 2002, Report NREL/CP 610-32405 [PR+PU]

D. DaCosta, M. Golben, D.C. Tragna: "Metal Hydride Thermal Hydrogen Compression", Proceedings 14th World Hydrogen Energy Conference, Montreal, June 9-13, 2002 [PR+PU]

D.H. DaCosta, M. Golben: "Advanced Thermal Hydrogen Compression", Proceedings of the 2003 U.S. DOE Hydrogen, Fuel Cells & Infrastructure Technologies 2003 Merit Review and Peer Evaluation Meeting, Berkeley, May 19-22, 2003, http://www.eere.energy.gov/hydrogenand fuelcells [PR]

Project H-10. Catalytically modified hydriding properties of novel complex hydrides (K. Gross [USA])

K.J. Gross, E. H. Majzoub, G. Sandrock: "Complex Hydrides for Light-Weight Hydrogen Storage", TMS2002, The Minerals, Metals & Materials Society, Seattle, Feb. 20, 2002 [PR]

K.J. Gross, E. H. Majzoub: "New Materials for Light-Weight Hydrogen Storage", 201st Meeting of The Electrochemical Society, Philadelphia, May 16, 2002 [PR]

K.J. Gross, E. H. Majzoub: "New Reversible Complex Hydrides for Practical Hydrogen Storage", 14th World Hydrogen Energy Conference, Montreal, June 9-13, 2002 [PR]

Project H-11. Solid state nuclear magnetic resonance spectroscopic studies of catalytically enhanced sodium aluminum hydride (C. Jensen [USA])

C.M. Jensen, K.J. Gross: "Development of catalytically enhanced sodium aluminum hydride as a hydrogen storage material", Appl. Phys. A, **72** (2001) 213-219 [PU]

C.M. Jensen, D. Sun, B. Lewandowski, K.K. Kumashiro, W.P. Niemczura, D. Morales-Morales, Z. Wang: "Catalytically Enhanced Hydrogen Storage Systems", Proceedings 2001 U.S. Department of Energy Hydrogen Program Annual Review Meeting, Baltimore, April 17-19, 2001, Report NREL/CP 570-30535, pp. 500-508 [PR+PU]

K.J. Gross, G.J. Thomas, C.M. Jensen: "Catalyzed alanates for hydrogen storage", J. Alloys and Compounds, **330-332** (2002) 683-690 [PR+PU]

G.J. Thomas, K.J. Gross, N.Y.C. Yang, C. Jensen: "Microstructural characterization of catalyzed $NaAlH_4$", J. Alloys and Compounds, **330-332** (2002) 702-707 [PR+PU]

K.K. Kumashiro, W. Niemczura, C.M. Jensen: "Solid State ^{1}H, ^{27}Al, and ^{23}Na NMR Studies of Doped and Undoped $NaAlH_4$", TMS2002, The Minerals, Metals & Materials Society, Seattle, Feb. 20, 2002 [PR]

D. Sun, T. Kiyobayashi, H.T. Takeshita, N. Kuriyama, C.M. Jensen: "X-ray diffraction studies of titanium and zirconium doped $NaAlH_4$: euclidation of doping induced structural changes and their relationship to enhanced hydrogen storage properties", J. Alloys and Compounds, **337** (2002) L8-L11 [PU]

C.M. Jensen, D. Sun, S.S. Raman, K. Murphy, W.P. Niemczura, K.K. Kumashiro, M. Eberhard, Z. Wang, X-Q. Gu: "Catalytically Enhanced Hydrogen Storage Systems", Proceedings of the 2002 U.S. DOE Hydrogen and Fuel Cells Program Annual Program/Lab R&D Review, Golden, May 6-10, 2002, Report NREL/CP 610-32405 [PR+PU]

C. Jensen, D. Sun, K. Kumashiro, W. Niemczura, K. Murphy, T. Kiyobayashi, H.T. Takeshita, N. Kuriyama: "Recent Advances in the Development of Doped $NaAlH_4$ as a Hydrogen storage Material: X-ray Diffraction and Solid State ^{1}H, ^{27}Al, and ^{23}Na NMR Studies", 201st Meeting of The Electrochemical Society, Philadelphia, May 16, 2002 [PR]

C. Jensen, D. Sun, K. Kumashiro, W. Niemczura, K. Murphy, T. Kiyobayashi, H.T. Takeshita, N. Kuriyama: "X-ray Diffraction and Solid NMR of Doped $NaAlH_4$: Fundamental Insights into a Promising New Hydrogen Storage Material", International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

D. Sun, T. Kiyobayashi, H.T. Takeshita, N. Kuriyama, C.M. Jensen: "Reaction Profiles of the Reversible Dehydrogenation of Titanium and Zirconium Doped $NaAlH_4$ to Na_3AlH_6", International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

C.M. Jensen, R.A. Zidan: “Hydrogen Storage Materials and Method of Making by Dry Homogenation”, U.S. Patent No. 6,471,935 B2, Oct. 29, 2002 [PA]

B. C. Hauback, H. W. Brinks, C. M. Jensen, K. Murphy, A. J. Maeland: “Neutron diffraction structure determination of $NaAlD_4$”, J. Alloys and Compounds, **358** (2003) 142 [PU] (see also Project HC-3)

G. Sandrock, K. Gross, G. Thomas, C. Jensen, D. Meeker, S. Takara: “Engineering Considerations in the Use of Catalyzed Sodium Alanates for Hydrogen Storage” J. Alloys and Compounds, **330-332** (2002) 696 [PR+PU]

T. Kiyobayashi, S.S. Srinivasan, D. Sun, C.M. Jensen: “Kinetic Study and Determination of the Enthalpies of Activation of Titanium and Zirconium Doped $NaAlH_4$ and Na_3AlH_6”, Journal of Physical Chemistry A., **107** (2003) 7671 [PU]

H.W. Brinks, C.M. Jensen, S.S. Srinivasan, B.C. Hauback, D. Blanchard, K. Murphy: “Synchrotron X-ray and Neutron Diffraction Studies of $NaAlH_4$ Containing Ti Additives”, submitted to J. Alloys and Compounds (2003) [PU]

J. Iniguez, T. Yildirim, T.J. Udovic, E.H. Majzoub, M. Sulic, C.M. Jensen: “Multi-phonon Scattering and Induced Hydrogen Dymanics in Sodium Alanate”, submitted to Chemical Physics Letters (2003) [PU]

C.M. Jensen: “Doped Sodium Aluminum Hydride: Fundamental Studies and Development of a Promising New Hydrogen Storage Material”, Staff Seminars, UOP Research Center, Des Plaines, IL, August 13, 2002 [PR]

C.M. Jensen: “Doped Sodium Aluminum Hydride: Fundamental Studies and Development of a Promising New Hydrogen Storage Material”, California Institute of Technology, Pasadena, CA, September 13, 2002.

C.M. Jensen: “Doped Sodium Aluminum Hydride: Fundamental Studies and Development of a Promising New Hydrogen Storage Material”, workshop ot the Research Association for the Development of Advanced Metal Hydrides, Osaka, Japan, March 14, 2003 [PR]

D. Sun, K.K. Kumashiro, W. Niemczura, K. Murphy, T. Kiyobayashi, H.T. Takeshita, N. Kuriyama, C.M. Jensen: “Recent Advances in the Development of Doped NaAlH4 as a Hydrogen Storage Material: X-ray Diffraction and Solid State 1H, 27Al, and 23Na NMR Studies”, European Materials Research Society 2003 Meeting, Symposium on Nanoscale Materials for Energy, Strasbourg, France, June 10-13, 2003 [PR]

D. Sun, S. Srinivasan, K. Murphy, M. Sulic, M. Kuba, A. Piwowar, C.M. Jensen: “Catalytically Enhanced Hydrogen Storage Systems”, Proceedings Proceedings of the 2002 U.S. DOE Hydrogen and Fuel Cells Program Annual Program/Lab R&D Review, Berkeley, CA, May 6-10, 2002 [PR+PU]

C.M. Jensen: “Doped Sodium Aluminum Hydride: “Fundamental Studies and Development of a Promising New Hydrogen Storage Material”, Staff Seminars, GE Global Research Center, Niskayuna, NY, July, 11, 2003 [PR]

C.M. Jensen: “Doped Sodium Aluminum Hydride: “Fundamental Studies and Development of a Promising New Hydrogen Storage Material” XII International Materials Research Congress, Cancun, Mexico, August 17-20, 2003 [PR]

C.M. Jensen: “Metal Hydrides as Reversible Hydrogen Storage Materials”, International Workshop on the Present Status of Hydrogen Technologies, Mexican Institute of Petroleum, Mexico City, Mexico, August 20-12, 2003 [PR]

Project H-12. Electronic design and mechanochemical synthesis of new hydrogen absorbing materials (Z.X. Guo [UK])

M. Bououdina, Z.X. Guo: “Comparative Study of Mechanical Alloying of (Mg+Al) and (Mg+Al+Ni) Mixtures for Hydrogen Storage”: J. Alloys and Comp., **336** (2002) 222-231 [PU]

Z.X. Guo, M. Bououdina, Y. Song, C. Shang: “Mechanical Alloying and Electronic Simulation of Mg-Based Hydrogen Absorbing Materials”, in Advanced Materials and Processing, eds. S. Hanada, Z. Zhong, S.W. Nam and R.N. Wright, JIM, 2001, pp.2917-2920 [PU]

Y.Song, Z.X Guo: “Electronic Strucutre of Magnesium Hydrides: A First-Principles Study”, 1st Int. Conf. Multiscale Materials Modelling, QMUL, London, 17-20 June, 2002 [PR]

T. Malinova, Z.X. Guo: “Artificial Neural Network Modelling of Hydrogen Storage Materials”, 1st Int. Conf. Multiscale Materials Modelling, QMUL, London, 17-20 June, 2002 [PR]

Z.X. Guo: “Hydrogen-Assisted Ball milling of Alloys and Hydrides”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

Z.X. Guo, Y. Song, T. Malinova, M. Bououdina: “Multi-Science Modelling of Hydrogen Storage Materials – A Case for Mg Hydrides”, International Symposium on Metal Hydrogen Systems, Annecy (MH2002), France, 1-6 September 2002 [PR]

M. Bououdina, Z.X. Guo: “Effects of TiH_2 on the Mechanical Alloying of (Ti+Al) Powder Mixtures”, J. Non-crystalline Solids, 2002, in press [PU]

C.X.Shang, M.Bououdina, Z.X.Guo: **“**Direct Mechanical Synthesis and Characterisation of $Mg_2Fe(Cu)H_6$”, International Symposium on Metal Hydrogen Systems, Annecy (MH2002), J. Alloys and Comp., **356-357** (2003) 626-629 [PR+PU]

C. X. Shang, M. Bououdina, Z.X. Guo: **“**Structural stability of mechanically alloyed (Mg + 10Nb) and (MgH_2+10Nb) powder mixtures”, J. Alloys and Comp., 349 (2003) 217-223. [PU]

Z.X. Guo, M. Bououdina, Y. Song, C. Shang: “Mechanical Alloying and Electronic Simulation of Mg-Based Hydrogen Absorbing Materials”, in Advanced Materials and Processing, eds. S. Hanada, Z. Zhong, S.W. Nam and R.N. Wright, JIM, 2001, pp.2917-2920 [PU]

C. X. Shang, M. Bououdina, Y. Song, Z.X. Guo**:** “Mechanical Alloying and Electronic Simulations of (MgH_2+M) Systems (M=Al,Ti,Fe,Ni,Cu and Nb) for H Storage”, Int. J. Hydrogen Energy, in press.

Project H-13. Hydrogen storage for fuel cell vehicle based on $NaAlH_4$ (D. Anton [USA])

D. Anton: “Hydrogen Storage in Alanates”, Proceedings of the 2002 U.S. DOE Hydrogen and Fuel Cells Program Annual Program/Lab R&D Review, Golden, May 6-10, 2002, Report NREL/CP 610-32405 [PR]

D. Anton: “Catalytic Effect of Transition Metal Additions to $NaAlH_4$ for Hydrogen Desorption”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

S. Opalka, D. Anton: “First Principals Study of the Structure and Properties of Sodium-Aluminum-Hydrogen Phases”, International Symposium on Metal Hydrogen Systems (MH2002), Annecy, France, 1-6 September 2002 [PR]

Project H-14. Development of nanostructured Li-based complex hydrides (S. Orimo [Japan])

Y. Nakamori, S. Orimo: “New functional designing of lithium-hydrogen systems (a review)”, Materia Japan, **42** (2003) 822-828 [PU]

Y. Nakamori, S. Orimo: “High-density hydrogen storage in complex hydrides”, All for Fuel-Cell (Industrial Survey Publisher), (2003) pp. 247-249 [PU]

Y. Nakamori, S. Orimo: “Destabilization of Li-based complex hydrides”, Journal of Alloys and Compounds, in press [PU]

Y. Nakamori, S. Orimo: “Synthesis and characterization of single phase Li_xBC (x = 0.5 and 1.0), using Li hydride as a starting material”, Journal of Alloys and Compounds, in press [PU]

Y. Nakamori, S. Orimo: “Li-N based hydrogen storage materials”, Materials Science and Engineering B, in press [PU]

S. Orimo, Y. Nakamori, A. Züttel: “Materials properties of MBH_4 (M = Li, Na, and K)”, Materials Science and Engineering B, in press [PU]

Y. Nakamori, S. Orimo: “Lithium based materials with hydrogen clusters”, invited talk, Proceedings of 12th International Symposium on Processing and Fabrication of Advanced Materials (ASM International), in press [PR+PU]

S. Orimo: “Development of non-conventional hydrogen storage materials”, invited talk, Symposium on Hydrides, Japanese Society of Chemical Engineering, Sendai, Japan, 29 January 2003 [PR]

S. Orimo, Y. Nakamori: “Cluster-type structures in Li-based complex hydrides”, Spring Meeting of Japan Institute of Metals, Chiba, Japan, 27-29 March 2003 [PR]

Y. Nakamori, S. Orimo: “Synthesis and hydrogen storage properties of Li-N-H systems”, Spring Meeting of Japan Institute of Metals, Chiba, Japan, 27-29 March 2003 [PR]

S. Orimo: “Fundamental researches on non-conventional hydrides”, invited seminar, Okayama University of Sciences, Okayama, Japan, 22 May 2003 [PR]

S. Orimo: “Nano-structural characterization on non-conventional hydrides”, invited talk, Theme Symposium of Japan Institute of Metals, Ehime, Japan, 23 May 2003 [PR]

S. Orimo: “Multi-functions of hydrogen clusters”, Annual Symposium in Institute for Materials Research, Tohoku University, Sendai, Japan, 29 May 2003 [PR]

S. Orimo, Y. Nakamori: “Structural designing and function of complex hydrides”, keynote lecture, Fall Meeting of Japan Institute of Metals, Sapporo, Japan, 11-13 October 2003 [PR]

Y. Nakamori, G. Kitahara, S. Orimo, K. Miwa, S. Towata: “Substitution effects on Li-based complex hydrides”, Fall Meeting of Japan Institute of Metals, Sapporo, Japan, 11-13 October 2003 [PR]

G. Kitahara, Y. Nakamori, S. Orimo, K. Miwa, S. Towata: “Synthesis and hydrogen storage property of Li-Mg-based nitrides”, Fall Meeting of Japan Institute of Metals, Sapporo, Japan, 11-13 October 2003 [PR]

K. Miwa, N. Ohba, Y. Nakamori, S. Orimo: “First-principles calculations of $LiBH_4$”, Fall Meeting of Japan Institute of Metals, Sapporo, Japan, 11-13 October 2003 [PR]

T. Yamagishi, M. Yokoyama, Y. Nakamori, S. Orimo: “Synthesis and hydrogen storage property of Li-based thin films”, Fall Meeting of Japan Institute of Metals, Sapporo, Japan, 11-13 October 2003 [PR]

Project H-15. Complex hydride compounds with enhanced hydrogen storage capacity (D. Anton [USA])

New project for 2004-2006 Task Extension.

Project H-16. Structure and thermodynamic properties of complex hydrides (A. Züttel [Switzerland])

New project for 2004-2006 Task Extension. See Project HC-5.