Curriculum vitae

Dan M. Lupu

Personal Details

Title:	Dr.
Family name:	**Lupu**
First name:	**Dan**
Gender:	male
Date of birth:	24/05/1942
Nationality:	Romanian
Marital status:	married
E-mail:	Dan.Lupu@itim-cj.ro

a) information about the degrees and diplomas:

1964 - university degree: chemist „Babes-Bolyai" University, Cluj-Napoca, Romania

1972 - Title: Doctor in chemistry - Ph.D Thesis at Institute of Chemistry "Raluca Ripan", Cluj Napoca,Romania, "Study of the mixed-valence iron trinuclear acetates". Coordinator: Acad. Raluca Ripan.

b) information about the professional experience and jobs:

Employment History:

1964-1973 Institute of Chemistry "Raluca Ripan", Cluj Napoca, Romania- researcher

1973-2012 National Institute for R&D of Isotopic and Molecular Technologies Cluj-Napoca
1987-2003 Head of Department of Materials; presently - Senior Researcher I

Experience:

1964-1973: ***Magnetochemistry***: construction of laboratory equipment for measurements of the magnetic susceptibility from 77K to 600K; interpretation of the data in terms of the valence state of transition metal ions and interactions between their magnetic moments; introducing students and researchers in magnetochemistry. ***Mixed valence compounds***: synthesis, electron transfer in mixed valence compounds studied by Mössbauer spectroscopy, UV-Vis-NIR spectra, magnetic exchange interactions.

1975-2012: ***Hydrogen storage materials and applications***: Preparation of Mg-based intermetallic compounds under inert atmosphere and of other intermetallic compounds by arc melting under argon. Fundamentals of metal-hydrogen systems: thermodynamics – pressure-composition isotherms (p-c-T), phase diagrams, absorption/desorption kinetics, isotopic (hydrogen/deuterium) effects, catalytic effects on hydrogen sorption by doping or ball milling.

Experimental equipment was developed for hydrogen absorption (adsorption) measurements to obtain p-c-T isotherms for solid state hydrogen storage materials: sample cell, valves and connections to avoid

hydrogen leakage. Studies on hydrogen absorption/desorption kinetics and cycling on metal hydrides; complex hydrides $NaAlH_4$ and $LiAlH_4$ to absorption/desorption after ball milling with catalysts in glove box. Preparation and characterization of metal hydride electrodes for Ni/MH batteries: electrodes with a proprietary composition (patented), discharge capacity, charge/discharge cycling.

June 2000 – D. Lupu worked as "Research guest" at Institute of Physics, University of Fribourg – Switzerland, well known in the field of hydrogen storage. Cooperation with Prof. Louis Schlapbach and Andreas Züttel, resulted in 2 publications [*J. of Alloys and Compounds,* 291, 289, (1999); 350, 319, (2003)].

The influence of lanthanide oxide on the catalytic effect of Ni was studied by isotopic exchange H/D experiments. Hydrogen uptake measurements on carbon nanofibers and carbon nanotubes performed by gravimetric (high pressure microbalance) and volumetric methods. The results, within the same range reported by Swiss, German and other groups well known in the field, did not confirm high H_2 storage capacity of carbon nanostructures reported by some authors.

Since 2008 the main interest is focused on porous metal-organic frameworks (MOFs) and their composites as advanced hydrogen storage materials: synthesis, characterization and H_2 adsorption (physisorption) p-c-T measurements. The upgraded equipment allows accurate measurements of hydrogen adsorption capacity in the range 77 – 400 K for small amounts of samples (100 mg) of highly porous materials (MOFs , and carbon materials).

2002-2008: ***Synthesis of carbon nanotubes:*** (i) Preparation of catalysts and synthesis of single-walled, multi-walled carbon nanotubes and carbon nanofibers by ***a new variant of catalytic chemical vapor deposition (CCVD), employing induction heating;*** (ii) Application of UV-VIS-NIR spectroscopy to identify the types of nanotubes (semiconducting/metallic) and their diameters in aqueous carbon nanotubes dispersions.

D. Lupu is reviewer for:

International Journal for Hydrogen Energy (USA) since 1980 (4 manuscripts in last 5 years);
Carbon (3).
Journal of Vibrational Spectroscopy.
Journal of Applied Electrochemistry.
Journal of Optoelectronics and Advanced Materials.

c) the address of the profile:

ISI Web of Knowledge - Researcher ID: C-3346-2009; http://www.researcherid.com/rid/C-3346-2009.
Scopus - Author ID: 7004270496.

The autonomy and visibility of the scientific activity*.*

(1) The original contributions evidencing for the first time temperature-dependent, intra-molecular electron transfer between Fe^{2+} to Fe^{3+} metal sites in mixed valence trinuclear oxo-bridged iron complexes [D.Lupu et al. *J. Inorganic Nucl. Chem.*, *34*, 2803, (1972) - cited 35 times] are recognized (in *J. Am. Chem. Soc.*, *122*, 11370, **2000**) as "initiated in the works of Lupu et al. by employing Mössbauer spectroscopy and magnetochemistry".
(2) A new synthesis method of carbon nanotubes was developed utilizing for the first time the induction heating of the catalyst, was developed in our laboratory, in cooperation with Dr. A. Jianu and Prof. E Burkel, from the University of Rostock - Germany [D. Lupu et al. *Carbon, 42*, 503, (2004)]. This made possible the

development of a new research direction of the department, promoting cooperation with foreign scientists and sustaining the partnership to projects for applications in nano-medicine and other areas.
(3) Since 1970, Dr. Dan Lupu published 89 articles: 43 on hydrogen and related materials, and 27 on carbon nanotubes, 36 of them as main author.

Principal investigator in the following projects:
- 2004-2006: Interface and surface phenomena in the synthesis of carbon nanotubes;
- 2006-2008 CEEX project: Advanced hydrogen storage materials for fuel cells (STOHIP);
- 2008-2011 PN II project: Hydrogen storage in composites based on porous metal-organic (COST-H);
- 2011-2014 PN-II-ID-PCE-2011-3-0350: Issues and challenges for hydrogen storage in composites with metal-organic frameworks;

Research guest at Institute of Physics - University of Fribourg, Switzerland (June 2000), well known in the field of hydrogen storage. 2 publications resulted, in cooperation with Prof. Louis Schlapbach and Andreas Züttel, in *J. of Alloys and Compounds,* 291, 289-294 (1999); 350, 319-323, (2003).

Hirsch index and the total number of citations, according to Web of Science:
Hirsch Index: Scopus h=14, total number of citations (without self-citations) = 480;

Invited lectures (selected) at:
(i) "Hydrogen in Metals" meeting January 5-6, 1976 Birmingham United Kingdom, later published in Journal of Less-Common Metals 49, 477, (1976), No. of citations: 21 (excluding self-citations);
(ii) **D. Lupu,** R. Grecu, S.I. Farcas, "Optical properties of Mg_2NiH_4 and hydrogen diffusion" at Proc. 3rd *Int. Symposium Metal-Hydrogen Systems,* Uppsala, 1992 Sweden, vol.I, p.685.(published in *Zeitschrift fur Physikalische Chemie (Frankfurt)* 181 S, 143, 1993);
(iii) **D. Lupu**: "Hydrogen Storage Materials at INCDTIM Cluj" at JRC-IE training Workshop on "Mapping European knowledge on Hydrogen Storage" 28-29 October 2004, **Joint European Research Centre**, Petten, Netherlands***:*** http://www.jrc***.***
(iv) status of invited speaker to prestige universities: University of Fribourg, Institute of Physics June 2000;

D. Lupu published with 137 co-authors. The original ideas attracted cooperation with many foreign scientists, resulting in publications: Prof. L. Schlapbach and A. Züttel, Univ. of Fribourg, Switzerland, Prof. E. Burkel, Dr. A. Jianu, Univ. Rostock, Germany (cooperation agreement); Prof. A. Weidenkaff Univ. Augsburg-Germany; Dr. A. Grueneiss, IFW Dresden, Germany; A. Gluhoi, Leiden University, Netherlands; Prof. L. Duclaux Univ. Orleans, France, Dr. Y. Soneda, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan; Dr. A.S. Biris, Univ. of Arkansas at Little Rock, USA.

Participation to FP-6 project proposals: „Particle coat" FP6-2003-NMP-TI-3-Main, coordinating Dr. D. Dowling from Univ. College Dublin.