

CURRICULUM VITAE

Personal information

Name: Wojciech Wegner
Status: PhD student
E-mail: w.wegner@cent.uw.edu.pl



Higher education

- 2015 - now** **University of Warsaw, Inter-Faculty Individual Studies in Mathematics and Natural Sciences**, PhD studies on novel functional materials based on boron.
Supervisors: prof. Wojciech R. Grochala, prof. Jacek A. Majewski.
- 2013 - 2015** **University of Warsaw, Faculty of Physics**, Nanostructure Engineering, cooperation with Faculty of Chemistry UW. Graduated with excellent grade with a MSc degree. Master thesis „Evaluation of derivatives of magnesium borohydride as precursors towards superconducting magnesium diboride coatings.” defended with honors.
Supervisors: prof. Wojciech R. Grochala, dr Michał Dobrowolski.
- 2012 - 2016** **Warsaw University of Technology, Faculty of Physics**, Applied Physics, Engineering studies, specialization Materials and Nanostructures. Engineering thesis „Studies on nanocrystalization in $\text{Li}_2\text{O}-\text{FeO}-\text{V}_2\text{O}_5-\text{P}_2\text{O}_5$ glasses in function of temperature by x-ray diffraction method.” defended with honors.
Supervisor: dr inż. Tomasz Pietrzak.
- 2010 - 2013** **University of Warsaw, Faculty of Physics**, Nanostructure Engineering, Inter-Faculty studies in cooperation with Faculty of Chemistry UW. BSc thesis „Synthesis and physicochemical characterization of holmium borohydride.” defended with honors.
Supervisor: dr Tomasz Jaroń.

Scientific experience

- 2014 – now** **Project leader**, Diamond Grant program, Ministry of Science and Higher Education (MNiSW). Research project implemented at Centre of New Technologies UW (CeNT UW).
- 2015 - now** **Co-investigator**, „Characteristics of molecular diode systems for nano-electronic circuits.” in Interdisciplinary Centre for Mathematical and Computational Modelling of University of Warsaw (ICM UW).
- 2016** **Project leader**, DSM2016 program, CeNT UW (internal project).
- 2013 - 2015** **Main investigator**, „Evaluation of organic derivatives of magnesium borohydride as precursors towards superconducting magnesium diboride coatings”. Preludium program, National Science Centre (NCN). Research project implemented at Centre of New Technologies UW (CeNT UW).

- 2014 - 2015** **Co-investigator**, „LOOP. Development of technology for recycling the reactants in the process of synthesis of mixed-metal borohydrides.”. Competition for the Grant program, University Technology Transfer Centre (UOTT UW). Research project implemented at Centre of New Technologies UW (CeNT UW).
- 2012 - 2014** **Co-investigator**, „Synthesis and physicochemical characterization of the derivatives of yttrium borohydride as potential hydrogen stores for fuel cells”. Iuventus Plus program, Ministry of Science and Higher Education (MNiSW). Research project implemented at Centre of New Technologies UW (CeNT UW).
- 2016** **Internship** at University of Waterloo (Canada) within the framework of cooperation between Waterloo Institute For Nanotechnology and MISMaP UW, 1-07-2016 do 30-09-2016, in prof. Holger Kleinke group. Professional training topics: Synthesis and physicochemical characterization of thermoelectric materials, including thermal, electric, thermoelectric and structural characterization, and quantum mechanical calculations for selected thermoelectric systems.
- 2014 - 2016** Member of group in Solid State Ionic Division, Faculty of Physics, Warsaw University of Technology.
- 2012 - 2015** One of founder members of Nanotechnology Student Scientific Association “Nanotubes” at the Faculty of Physics, University of Warsaw.
- 2012** Professional internship, Polish Academy of Sciences, Institute of Physics. Growth and characterization of oxide materials.
- 2011 - now** Member of Laboratory of Technology of Novel Functional Materials in Centre of New Technologies, University of Warsaw.

List of publications

- 2016** **W. Wegner**, T. Jaroń, M. A. Dobrowolski, Ł. Dobrzycki, M. K. Cyrański, W. Grochala, “Organic derivatives of Mg(BH₄)₂ as precursors towards MgB₂ and novel inorganic mixed-cation borohydrides”, *Dalton Trans.*, 2016, **45**, 14370.
- 2016** P. Szarek, **W. Wegner**, W. Grochala, „Ferromagnetic Ground State for Hypothetical Iron-Based Extended Metal Atom Chain”, *Journal of Molecular Modeling*, 2016, **22:63**.
- 2015** A. Starobrat, M. J. Tyszkiewicz, **W. Wegner**, D. Pancerz, P. A. Orłowski, P. J. Leszczyński, K. J. Fijałkowski, T. Jaroń, W. Grochala, „Salts of highly fluorinated weakly coordinating anions as versatile precursors towards hydrogen storage materials” *Dalton Trans.*, 2015, **44**, 19469.
- 2015** T. Jaroń, P. Orłowski, **W. Wegner**, K. J. Fijałkowski, P. J. Leszczyński, W. Grochala, „Hydrogen Storage Materials: Room-Temperature Wet Chemistry Solution of the "Dead Mass" Problem” *Angew Chem Int Ed Engl*, 2015, **54(4)**, 1236-1239. HOT PAPER.
- 2015** T. Jaroń, **W. Wegner**, K. J. Fijałkowski, P. J. Leszczyński, W. Grochala, „Facile formation of thermodynamically unstable novel borohydride materials via a wet chemistry route” *Chem Eur J*, 2015, **21(15)**, 5689-5692. Back cover.

- 2015** W. Grochala, T. Jaroń, **W. Wegner**, D. Pancierz, „Novel lanthanide borohydrides: magnetism of all flavours” *Acta Cryst. A70*, 2014, C275.
- 2014** **W. Wegner**, T. Jaroń, W. Grochala, „Polymorphism and hydrogen discharge from holmium borohydride, Ho(BH₄)₃, and KHo(BH₄)₄” *Int J Hydrogen Energy*, 2014, **39(35)**, 20024-20030.
- 2013** **W. Wegner**, T. Jaroń, W. Grochala, „Structures of MYb(BH₄)₄ (M = K, Na) from laboratory X-ray powder data” *Acta Cryst. C69*, 2013, 1289-1291.
- 2013** T. Jaroń, **W. Wegner**, W. Grochala, „M[Y(BH₄)₄] and M₂Li[Y(BH₄)_{6-x}Cl_x] (M = Rb, Cs): new borohydride derivatives of yttrium and their hydrogen storage properties”, *Dalton Trans.*, 2013, **42**, 6886-6893.
- 2012** T. Jaroń, **W. Wegner**, W. Grochala, „Tetrabutylammonium cation in a homoleptic environment of borohydride ligands: [(n-Bu)₄N][BH₄] and [(n-Bu)₄N][Y(BH₄)₄]”, *Journal of Solid State Chemistry*, 2012, **191**, 279–282.

Conferences

- 2016** **Poster presentation** „Structure and properties of derivatives of magnesium borohydride, as an exemplary view on applying laboratory X-ray powder data for metal borohydrides systems investigations”, 15th European Powder Diffraction Conference (EPDIC15), Bari (Italy) – main author.
- 2015** **Oral presentation** „Novel [BH₄]⁻ functional materials: synthesis and applications.”, International Conference on Functional Molecular Materials FUNMAT 2015, Cracow (Poland) – main author.
- 2015** **Oral presentation** „Metal borohydrides: the comprehensive novel functional materials.”, Open Readings 2015, 58th Scientific Conference for Students of Physics and Natural Sciences, Vilnius (Lithuania) – main author.
- 2015** **Poster presentation** „Evaluation of new wet chemistry method of borohydrides synthesis.”, Open Readings 2015, 58th Scientific Conference for Students of Physics and Natural Sciences, Vilnius (Lithuania) – co-author.
- 2014** **Oral presentation** „Novel lanthanide borohydrides: magnetism of all flavours”, Congress and General Assembly of the International Union of Crystallography, Montreal (Canada) – co-author.
- 2014** **Poster presentation** „Evaluation of organic derivatives of magnesium borohydride as precursors towards superconducting magnesium diboride coatings”, 30th European Conference on Surface Science (ECOSS-30), Antalya (Turkey) – main author.
- 2014** **Oral presentation** „New scalable wet fluorine chemistry method for preparation of dead-mass free hydrogen storage materials”, 248th ACS National Meeting & Exposition w San Francisco (CA, USA) – co-author.
- 2014** **Oral presentation** „New method of synthesis of dead-mass free mixed-cation borohydride materials for hydrogen storage applications.”, The 14th International Symposium on Metal-Hydrogen Systems (MH2014), Manchester (UK) – co-author.
- 2014** **Poster presentation** „Mechanochemical synthesis of new rare-earth borohydrides.”, The 14th International Symposium on Metal-Hydrogen Systems (MH2014), Manchester (UK) – main author.

- 2014** **Poster presentation** „Ewaluacja metody syntezy borowodorków”, II Ogólnopolskie Forum Chemii Nieorganicznej - Horyzonty Chemii (Polish Inorganic Chemistry Conference), Wrocław (Poland) – co-author.
- 2014** **Poster presentation** „Borowodorki jako prekursorzy borków metali na przykładzie Mg i Sc”, II Ogólnopolskie Forum Chemii Nieorganicznej - Horyzonty Chemii (Polish Inorganic Chemistry Conference), Wrocław (Poland). The presentation was awarded in the competition for the best poster.
- 2014** **Oral presentation** „Nowa metoda syntezy bogatych w wodór borowodorków”, II Ogólnopolskie Forum Chemii Nieorganicznej - Horyzonty Chemii (Polish Inorganic Chemistry Conference), Wrocław, (Poland) – co-author.
- 2013** **Oral presentation** „Synthesis of Novel Borohydrides for Hydrogen Storage: Mechanochemistry vs. Reactions in Solutions”, International Symposium on Mechanochemistry in Synthesis and Nanoscience (ISMech 2013), Warsaw - Ossa (Poland) – co-author.
- 2013** **Poster presentation** „Synthesis of novel mixed rare-earth borohydrides: a mechanochemical approach”, International Symposium on Mechanochemistry in Synthesis and Nanoscience (ISMech 2013), Warszawa - Ossa (Poland) – main author.
- 2012** **Oral presentation** „Novel Derivatives of Yttrium Borohydride for Hydrogen Storage”, International Symposium on Metal Hydrogen Systems (MH2012), Kyoto (Japan) – co-author.
- 2012** **Participation in** 9th International Conference on Nanosciences & Nanotechnologies and 6th International Summer Schools on N&N:Organic Electronics & Nanomedicine, Thessaloniki (Greece).

Patent applications

- 2013** **Patent application** „A method of synthesis of unsolvated mixed cation borohydrides”, number of publication: WO 2015040480 A1.
Polish patent application P.405397, 19.09.2013;
International patent application PCT/IB2014/001884, 18.09.2014, Japan and USA included.

Awards and Scholarship

- 2015** **3rd award** in European BEST Engineering Competition Final 2015 – category **Case Study**, Porto (Portugal). Previously victory in Polish National Final and Warsaw Local Final.
- 2013** **DuPont special prize** for BSc thesis.
- 2013 - 2015** **University of Warsaw Scholarship** granted for 5% of the best students.
- 2013 - 2015** **Scholarship of the capital city of Warsaw** for students.
- 2012 - 2015** **Ministry of Science and Higher Education Scholarship** for outstanding research achievements, for students.
- 2010 - 2015** **European Social Fund "New challenges - new directions" scholarship** for the best students.

Languages

- English : advanced
- German : pre-intermediate.
- French : beginner.

Selected skills

Programming skills: C, C++, cuda C, Java, G (LabVIEW), Python

Ability to use(selected): Matlab, MS Office, OpenOffice, LibreOffice, Origin, Jana2006, Topas, Materials Studio, Fox, OPUS (Bruker), Diffract Measurement Center (Bruker), Netzsch Software, Quantum Design Software, Windows and Linux (unix) systems, Mercury, Vesta

Research techniques

Advanced: FTIR, PXRD, TGA/DSC with EGA (MS), DTA, structure solving and refinement using powder method, SQUID, inorganic, organic and mechanochemical (high energy milling) synthesis

Basic: XPS, Raman, PPMS, AFM/SEM/TEM

Computer modelling: Gaussian, Medea (with VASP), Quantum Espresso, ELK