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Employment and positions

Institute of Metallurgy and Materials Science, Polish Academy of Sciences, research associate (from 2005-2012), assistant professor (2013-2017), associate professor (2017-).

Dr. Adam Dębski has been employed at the Institute of Metallurgy and Materials Science of Polish Academy of Sciences PAS as a mechanic (from 2003), assistant (from 2005) and next as an associate professor (from 2013).

From 2005-2014 was an expert at the Accredited Testing Laboratories of the Polish Centre for Accreditation at the Institute of Metallurgy and Materials Science PAS: Laboratory of Spectral Chemical Analysis L-6,

Since 2013 is head of the Physicochemical Test Laboratory L-8 at the Institute of Metallurgy and Materials Science of Polish Academy of Sciences PAS.

Scientific Career

M.Sc.: Cracow University of Technology, 2003

Ph.D.: Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2013.

D.Sc. - Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2017.

Scientific achievements

115 papers, among them: **84** papers in reference to journals cited by the Institute for Scientific Information in Philadelphia and 3 monographs

The most relevant publications during last 5 years

1.

S. Terlicka, **A. Dębski**, M. Saternus, A. Fornalczyk, W. Gąsior, Experimental results of the Li-Pb-Pt system obtained by the high temperature drop calorimetry, Journal of Molecular Liquids, 332 (2021) 115824.

2.

A. Dębski, S. Terlicka, W. Gąsior, W. Gierlotka, M. Pęska, J. Dworecka-Wójcik, M. Polański,

Calorimetric studies of magnesium-rich Mg-Pd alloys, *Materials*, 14(3) (2021) 680.

3.

W. Gierlotka, I-T Lin, S.-W Chen, W. Gąsior, **A. Dębski**, Re-optimization of the binary Sb - Se system aided by ab-initio calculation, *Calphad*, 73 (2021) 102257.

4.

M. Zabrocki, W. Gąsior, **A. Dębski**, Thermodynamic properties of Ga-In-Li alloys - a potential material for liquid metal batteries, 332 (2021) 115765.

5.

W. Gierlotka, **A. Dębski**, S. Terlicka, W. Gąsior, M. Pęska, M. Polański, I.T. Lin, Insight into phase stability in the Mg - Pt system. The ab initio calculations, *Journal of Phase Equilibria and Diffusion*, (DOI: 10.1007/s11669-020-00857-7).

6.

S. Kulawik, W. Gierlotka, **A. Dębski**, W. Gąsior, A. Zajączkowski, Calorimetric and phase diagram studies of the Ga-In-Zn system, *Journal of Molecular Liquids* 325 (2021) 115114.

7.

A. Dębski, W. Gierlotka, S. Terlicka, W. Gąsior, On the Mg-Pb system. Calorimetric studies and thermodynamic calculations, *Journal of Alloys and Compounds* 861 (2021) 158396.

8.

A. Dębski, M. Pęska, J. Dworecka-Wójcik, S. Terlicka, W. Gąsior, W. Gierlotka, M. Polański, The structural and calorimetric studies of magnesium-rich Mg-Pd alloys, *Journal of Alloys and Compounds* 858 (2020) 158085.

9.

W. Gierlotka, J. Lee, V. Lim, W. Gąsior, **A. Dębski**, On the Bi-Ni system. Ab initio calculations and thermodynamic remodeling, *Calphad*, 69 (2020) 101750.

10.

S. Kulawik, W. Gierlotka, **A. Dębski**, W. Gąsior, A. Zajączkowski, Thermodynamic assessment of the Ga-Sn-Zn system, *Calphad*, 69 (2020) 101765.

11.

E. Beltowska-Lehman, A. Bigos, M.J. Szczerba, M. Janusz-Skuza, L. Maj, **A. Dębski**, G. Wiazania, M. Kot, Heat treatment of ultrasonic electrodeposited Ni-W/ZrO₂ nanocomposites, *Surface & Coatings Technology* 393 (2020) 125779.

12.

S. Terlicka, **A. Dębski**, M. Saternus, A. Fornalczyk, W. Gąsior, Calorimetric investigation of the Li-Pt system, *Journal of Molecular Liquids*, 312 (2020) 113446.

13.

S. Terlicka, W. Gąsior, **A. Dębski**, Thermodynamic properties of Li-Sb liquid solution by QAM, *Metallurgical and Materials Transactions A*, 51 (2020) 4826-4837.

14.

W. Gierlotka, **A. Dębski**, S. Terlicka, M. Saternus, A. Fornalczyk, W. Gąsior, On the Pb-Pd system. Calorimetric studies and ab-initio aided thermodynamic calculations, *Journal of Molecular Liquids*, 313, (2020) 113808.

15.

M. Saternus, A. Fornalczyk, W. Gąsior, **A. Dębski**, and S. Terlicka, Modifications and Improvements to the Collector Metal Method Using an mhd Pump for Recovering Platinum from Used Car Catalysts, *Catalyst*, 10 (2020) 880.

16.

S. Terlicka, **A. Dębski**, W. Gąsior, W. Gierlotka, M. Peńska, M. Polański, Thermodynamic properties of Mg-Pt liquid alloys, *Journal of Molecular Liquids*, 317 (2020) 113976.

17.

A. Dębski, S. Terlicka, W. Gąsior, W. Gierlotka, M. Pęska, M. Polański, Thermodynamic properties of Mg-Pd liquid alloys, *Journal of Molecular Liquids*, 317(1) (2020) 114024.

18.

S. Terlicka, **A. Dębski**, M. Saturnus, A. Fornalczyk, W. Gąsior, Calorimetric measurements of the Li-Pd system, *Journal of Molecular Liquids*, 318 (2020) 114074.

19.

W. Gierlotka, **A. Dębski**, S. Terlicka, W. Gąsior, M. Pęska, M. Polański, Insight into phase stability in the Mg - Pd system. The ab-initio calculations, *Journal of Phase Equilibria and Diffusion*,

20.

S. Kulawik, A. Zajączkowski, **A. Dębski**, W. Gąsior, W. Gierlotka, Thermodynamics of liquid In-Ga-Zn alloys determined by vapor pressure method, *Calphad*, 71 (2020) 102198.

21.

M. Zabrocki, W. Gąsior, **A. Dębski**, Calorimetric study and thermodynamic description of Ga-Ge-Li liquid alloys, *Calphad*, 71 (2020) 102204.

22.

M. H. Braga, **A. Dębski**, S. Terlicka, W. Gąsior, A. Góral, Experimental and ab initio study of the Ag-Li system for energy storage and high temperature solders, *Journal of Alloys and Compounds*, 817 (2020) 152811.

23.

M. H. Braga, **A. Dębski**, S. Terlicka, W. Gąsior, A. Góral, The Ag-Li system's experimental and ab initio thermodynamic dataset, *Data in brief*, 28 (2020) 104939.

24.

A. Bigos, M. Janusz-Skuza, M. J. Szczerba, M. Kot, S. Zimowski, **A. Dębski**, E. Beltowska-Lehman, The effect of heat treatment on the properties of electrodeposited Ni-Mo

coatings, *Journal of Materials Processing Technology*, 276 (2020) 116397.

25.

S. Kulawik, A. Zajączkowski, **A. Dębski**, W. Gąsior, W. Gierlotka, Thermodynamics of liquid Ga-Sn-Zn alloys determined by vapor pressure method, *Journal of Molecular Liquids*, 300 (2020) 112310.

26.

S. Terlicka, **A. Dębski**, W. Gierlotka, A. Wierzbicka-Miernik, A. Budziak, A. Sypien, M. Zabrocki, W. Gąsior, Structural and physicochemical investigations of Ag-rich alloys from Ag-Al system, *Calphad*, 68 (2020) 101739.

27.

Z. Łodziana, **A. Dębski**, G. Cios, A. Budziak, Ternary LaNi_{4.75}M_{0.25} hydrogen storage alloys: surface segregation, hydrogen sorption and thermodynamic stability, *International Journal of Hydrogen Energy*, 44 (2019) 1760-1773.

28.

S. Terlicka, **A. Dębski**, A. Budziak, M. Zabrocki, W. Gąsior, Structural and physical studies of the Ag-rich alloys from Ag-Li system, *Thermochimica Acta*, 673 (2019) 185-191.

29.

M. Saturnus, A. Fornalczyk, W. Gąsior, **A. Dębski**, S. Terlicka, Extraction and purification of PGM solutions obtained from metallurgical treatment of used automotive catalytic converters, *METAL 2019 Conference Proceedings*, (2019) 1381-1386; ISBN- 978-80 -87 294-92-5.

30.

A. Pajdak, N. Skoczylas, **A. Dębski**, J. Grzegorek, W. Maziarz, M. Kudasik, CO₂ and CH₄ sorption on carbon nanomaterials and coals - comparative characteristics, *Journal of Natural Gas Science and Engineering* 72 (2019) 103003.

31.

W. Gąsior, **A. Dębski**, Surdat 3 Database of physicochemical properties of alloys, Institute of Metallurgy and Materials Science PAS, ISBN 978-83-60768-08-2, Kraków 2019.

32.

A. Dębski, S. Terlicka, A. Budziak, W. Gąsior, Calorimetric and XRD studies of Ag-rich alloys from Ag-Li system, Journal of Alloys and Compounds, 732 (2018) 210-217.

33.

S. Terlicka, **A. Dębski**, W. Gąsior, Thermodynamic properties of Li-Pb system, Journal of Molecular Liquids 249 (2018) 66-72.

34.

S. Terlicka, **A. Dębski**, W. Gąsior, Thermodynamic description of the Ga-Li-Zn system, Thermochemica Acta, 659 (2018) 66-73.

35.

W. Gąsior, M. Zabrocki, **A. Dębski**, Thermodynamic description of the Ge-Li liquid alloys, Journal of Molecular Liquids 249 (2018) 1107-1112.

36.

W. Gąsior, **A. Dębski**, M. Zabrocki, Thermodynamic description of the Ge-In-Li liquid alloys, Journal of Molecular Liquids, 260 (2018) 415-422.

37.

A. Dębski, M.H. Braga, S. Terlicka, W. Gąsior, A. Góral, Formation enthalpy of Ga-Li intermetallic phases. Experiment vs. calculations, Journal of Chemical Thermodynamics, 124 (2018) 101-106.

38.

S. Terlicka, **A. Dębski**, P. Fima, Enthalpy of mixing of ternary Li-Pb-Sb alloys, Journal of Phase Equilibria and Diffusion, 39 (4) (2018) 412-425.

39.

A. Dębski, W. Gašior, Bazy danych właściwości fizykochemicznych i termodynamicznych, rozdział w 65 lat IMIM PAN, (2017) 105-120.

40.

A. Dębski, S. Terlicka, W. Gašior, Badania termodynamiczne stopów z litem jako materiałów do magazynowania energii, rozdział w 65 lat IMIM PAN, (2017) 335-350.

41.

A. Dębski, Calorimetric measurements of Ga-Li system by direct reaction method, Archives of Metallurgy and Materials, 62(2) (2017) 919-926.

42.

A. Dębski, M. Zabrocki, W. Gašior, Calorimetric study and thermodynamic description of liquid In-Li alloys, Journal of Molecular Liquids 243 (2017) 72-77.

43.

A. Dębski, B. Onderka, W. Gašior, T. Gancarz, Phase equilibria in the Bi-In-Sn-Zn system. Thermal analysis vs. calculations, Archives of Metallurgy and Materials,

44.

A. Dębski, G. Garzeł, W. Zakulski, W. Gašior, Calorimetric measurements of the Ca-Li liquid alloys, Journal of Mining and Metallurgy, Section B: Metallurgy, 53(3) (2017) 203-208.

45.

W. Gašior, **A. Dębski**, S. Terlicka, Calorimetric and Electromotive Force Measurements of Al-Li-Zn Liquid Solutions, Journal of Phase Equilibria and Diffusion, 15(79) (2016) 1-10.

46.

W. Gašior, **A. Dębski**, Thermodynamic properties of liquid Ag-Li alloys, The Journal of Chemical Thermodynamics, 101 (2016) 270-277.

47.

W. Gaşior, **A. Dębski**, SURDAT 3 - a database of physicochemical properties of alloys, Polish Academy of Sciences, Annual report 2016, 55-56.

48.

A. Dębski, W. Gaşior, K. Szmit, Calorimetric measurements of liquid Al-Zn alloys, Metallurgical and Materials Transactions A, 47A (2016) 4933-4940.

49.

S. Terlicka, **A. Dębski**, W. Gaşior, R. Dębski, Thermodynamic properties of Ga-Zn system. Experiment vs model, Journal of Chemical Thermodynamics, 102 (2016) 341-347.

50.

A. Dębski, S. Terlicka, W. Gaşior, A. Góral, Calorimetric study of the Li-Zn system, 103 (2016) 374-380.

51.

A. Dębski, W. Gaşior, R. Dębski, Thermodynamic properties of liquid Ga-Li alloys: experiment vs. modeling, J. Chemical Thermodynamics 97 (2016) 348-353.

52.

A. Dębski, W. Gaşior, Calorimetric measurements of the Li-Zn system. Direct reaction method and mixing enthalpy, J. Chemical Thermodynamics, 98 (2016) 111-117.

53.

S. Terlicka, **A. Dębski**, P. Fima, Enthalpy of formation of Li₂Sb and Li₃Sb and mixing enthalpy of liquid Li-Sb alloys, Journal of Alloys and Compounds, 673 (2016) 272-277.

54.

A. Dębski, S. Terlicka, Calorimetric measurements of liquid (Al+Li+Zn) alloys, J. Chemical Thermodynamics, 92 (2016) 91-96.

55.

S. Terlicka, **A. Dębski**, Mixing enthalpy of liquid Ga-Li-Zn alloys, *Thermochimica Acta*, 625 (2016) 3-8.

Research Projects

Projects from Ministry of Science and Higher Education

-

Thermodynamic properties of alloys from Mg-Pd and Mg-Pt systems, (Project No. 2018/31/B/ST8/01371), IMMS PAS-MUT, supervisor, 2019-2022.

-

Influence of lithium concentration in Pb-Li alloys on wettability and efficiency of metal extraction from thin catalytic layers in porous ceramic capillaries. Research, modeling, (Project No. 2017/27/B/ST8/01464), IMMS PAS, participant, 2018-2021.

-

Thermodynamic properties and structure alloys from the Ga-In-Li system, (Project No. 2016/21/B/ST8/01031), IMMS PAS, participant, 2017-2020.

-

Thermodynamic characterization of the Ga-Li system, (Project No. 2014/13/D/ST8/03147), IMMS PAS, supervisor, 2015-2018.

-

Thermodynamic studies of Ag-Li alloys as a material for safe storage of hydrogen, (Project No.

IP2012035572), IMMS PAS, supervisor, 2013-2015.

-

Thermodynamic properties and phase diagram of Ag-Bi-Cu alloys, (Project No. IP2011 012571), IMMS PAS, participant, 2012-2014.

-

Thermodynamics of alloys for safe hydrogen storage and energy, IMMS PAS, supervisor, 2012-2014.

-

Thermodynamic properties and phase diagrams of Be-B and Be-Li alloys as materials for safe hydrogen storage, (Project No. 2011/01/D/ST8/01630), IMMS PAS, participant 2011-2014.

-

Thermodynamic research on Li-Si alloys as a material for safe storage of hydrogen, (Project No. IP2010007170), IMMS PAS, supervisor, 2010-2011.

-

Thermodynamic properties of Ca-Li alloys as a material to safe hydrogen storage, (Project No. N N508379235), IMMS PAS, participant, 2008-2011.

-

Phase equilibria in the Bi-In-Sn-Zn system. (Project No. N N507 457237), IMMS PAS, participant, 2009-2012.

-

Development to SURADT database using measurements of viscosity and evaluation of wettability of Pb-free solders on Cu substrate, (Project No. 4582/BT08/2007/33), IMMS PAS, participant, 2007-2010.

European Union Projects

-

COST, Action 535 - *Thermodynamics of alloyed aluminides (Thalu)*, Project: Production and optimization of intermetallics properties, IMMS PAS, participant, 2004-2007.

-

COST, Action MP 0602- *Advanced solder materials for high temperature applications - HISOLD*, Project: Complex study of thermodynamic and physico-chemical properties and structural characteristics of materials for potential use as high-temperature lead-free solders, IMMS PAS, participant, 2007-2010.

-

Advanced materials and technologies for their production, IMIM PAN, participant, 2010-2013.

-

Adaptation of the research potential of IMMS PAS to the requirements of global standards for comprehensive research in the field of materials science, (Project POIG.02.01.00-12-175/09), IMMS PAS, participant, 2011-2014

Prizes and awards:

2017 - IMMS PAS Director Award for fifth place in the group of young researchers in the evaluation of scientific research achievements for 2015-2016.

2015 - IMMS PAS Director Award for third place in the group of young researchers in the evaluation of scientific research achievements for 2013-2014.

2013 - IMMS PAS Director Award for first place in the group of young researchers in the evaluation of scientific research achievements for 2011-2012.

2013 - Ph.D. with honour.

2010 Special remark in Who's Who in Science and Engineering 2011-2012 (11th Edition).

Education of scientific staff

-

2019 - Care for trainee MUT, Magda Pęska.

-

2018 - Care for trainee AGH, Emil Broszkiewicz.

-

2018 - Care for trainee AGH, Magdalena Bork.

-

2017 - Care for trainee AGH, Karolina Kunicka.

-

2017 - Care for trainee WUT, Dominika Maciocha.

-

2015 - Care for trainee JU Marta Mamełka.

-

2014-2015 - Supervisor of master of science thesis inż Katarzyna Szmit; „The thermodynamic studies of selected properties of alloys of Al-Li-Zn system”.

-

2014 - Care for trainee AGH Katarzyna Kurek.

-

2013 - Care for trainee AGH Katarzyna Szmit.

Reviewer

Journal of Alloys and Compounds.

Membership in professional societies

Member - Associated Phase Diagram and Thermodynamics Committee.

Main scientific interest

Calorimetry (solution calorimetry), intermetallic phases, physicochemical properties of lead free solders.