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Employment and positions

AGH-University of Science and Technology, Cracow, Poland, Faculty of Metallurgy and Materials Science: research assistant (1998 -2004), Institute of Metallurgy and Materials Science, Polish Academy of Sciences: assistant professor (2005-2016), specialist for environmental research equipment (2016-2019), professor of Polish Academy of Sciences (from 2019), From 2015 Head of Accredited Testing Laboratories of the Institute of Metallurgy and Materials Science of the Polish Academy of Sciences. Expert in the Testing Laboratory of Scanning Electron Microscopy from 2005.

Scientific Career

M.Sc.: AGH-University of Science and Technology, Cracow, Faculty of Metallurgy and Materials Science, 1998

Ph.D.: AGH-University of Science and Technology, Cracow, Faculty of Metallurgy and Materials Science, 2004

Ph.D.,D.Sc.: IMIM PAN- Institute of Metallurgy and Materials Science Polish Academy of Sciences, 2019

Scientific achievements

The most relevant publications during last 5 years

1.

A. Sypien, G. Garzeł, T. Czeppe, „Thermomechanical behavior of amorphous alloys based on titanium at the temperature range of the glass transition and crystallization”, Materials Science & Engineering A, 2019, 743, 77-86 (MNiSW2019:

2.

P. Wilczek, P. Gach, K. Jendryczko, M. Marcisz G. Wilczek, R. Major, A. Mzyk **A. Sypien**, A.Samotus, 2018, Biomechanical and morphological stability of acellular scaffolds for tissue-engineered heart valves depends on different storage conditions, Journal of Materials Science: Materials in Medicine, 29, 106, 3-16,

3.

G. Kulesza-Matlak, K. Gawlińska, Z. Starowicz, **A. Sypien**, K. Drabczyk, B. Drabczyk, M.Lipiński, P. Zięba, 2018, Black silicon obtained in two step short wet etching as a texture for silicon solar cells-surface microstructure and optical properties studies, Arch. Metal. Mater., 63, 2, 1009-1017,

4.

M. Musztyfaga-Staszuk, Ł. Major, G. Putynkowski, **A. Sypien**, K. Gawlinska, P. Panek, P. Zieba, 2018, New kind of Cu based paste for Si solar cells front contact formation, Materials Science-Poland, 36, 3, 469-476,

5.

W. Wołczyński, **A. Sypień**, A. Tarasek, A.W. Bydątek, 2017, Copper droplets agglomeration/coagulation in the conditions similar to industrial ones, Archives of Metallurgy and Materials, 62, 307 -314,

6.

P. Panek, B. Swatowska, **A. Sypien**, M. Musztyfaga-Staszuk, M. Jakubowska, „The stencil printing for front contact formation on the silicon solar cells”, Przegląd Elektroniczny, 2017, 93, 3, 272-275,

7.

A. Sypien, K. Badura, P. Fima, K. Miernik, "Effect of Pd, temperature and time on wetting and interfacial microstructure of bulk metallic glasses TiCuZrPd and Ti-6Al-4V substrate", Journal of Alloys and Compounds, 2017, 695, 962-970,

8.

Z. Huber, J. Wojewoda-Budka, A. Wierzbicka-Miernik, **A. Sypien**, M. Szczerba, P. Zieba, 2016, Influence of phosphorous content on microstructure development at the Ni-P plating/SAC interface, Electronic Materials Letters, 12, 178-185

9.

D. M. Fronczek, J. Wojewoda-Budka, R. Chulist, **A. Sypien**, A. Korneva, Z. Szulc and P. Zięba, 2016, Structural properties of Ti/Al clads manufactured by explosive welding and annealing, Material and Design, 91, 80-89,

10.

T. Czeppe, **A. Sypien**, A. Wierzbicka-Miernik, Modification of the Ti₄₀Cu₃₆Zr₁₀Pd₁₄ BMG Crystallization Mechanism with Heating Rates 10-140 Kmin⁻¹, Journal of Materials Engineering and Performance, 2016, 5289-5301

11.

A. Sypien, M. Stoica, T. Czeppe, „Properties of the Ti₄₀Cu₃₆Zr₁₀Pd₁₄ Modified by Sn and Nb Additions”, Journal of Materials Engineering and Performance, 2016, 25, 800-808,

12.

P. Fima, G. Garzeł, **A. Sypien**, 2014, Wetting of Cu pads by Bi-2.6Ag-xCu alloys and phase equilibrium in the Ag-Bi-Cu system Journal of Electronic Materials, 43, 4365-4373,

13.

W. Wołczyński, Z. Pogoda, G. Garzeł, B. Kucharska, **A. Sypień**, T. Okane, 2015, Part III. Kinetics of the (Zn) - coating deposition during stable and meta-stable solidifications, Archives of Metallurgy and Materials, 60, 1, 199-207,

14.

W. Wołczyński, Z. Pogoda, G. Garzeł, B. Kucharska, **A. Sypień**, T. Okane, 2014, Part II. Model for the Protective Coating Formation during Hot Dip Galvanizing, Archives of Metallurgy and Materials, 59, 1393 -1404,

15.

A. Sypień, T. Czeppe, G. Garzeł, L. Lityńska-Dobrzyńska, J. Latuch, N. Q. Chinh, "Thermal stability and mechanical properties of the TiCuZrPd BMG's with 10, 14 and 20 at.% Pd", Journal of Alloys and Compounds, 2014, 615, 108-112,

16.

S. Gyurov, G. Stefanov, T. Czeppe, **A. Sypień**, E. Fazakas, L. Varga, L. Stojanova, K. Russew, 2014, Thermal stability and viscous flow features of al 85 co 2 nd 4 ni 5 y 4 amorphous alloy, Journal of Chemical Technology & Metallurgy, 49, 4, 407-417,

17.

A. Sypień, "Observation of the complex local crystallization process in Ti-Zr-Cu-Pd amorphous ribbons and bulk metallic glass", Archives of Metallurgy and Materials, 2013, 58, 2, 347-350,

Research Projects

Projects from Ministry of Science and High Education

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Application of transient liquid phase diffusion bonding (TLP) for manufacturing electronic interconnections designed for serving in elevated temperatures, International project with Holland No. 378/N-Eindhoven/2009/0, IMIM PAN, participant, 2009-2012

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Influence of selected alloying elements on the crystallization and mechanical properties of metallic glasses NiNb (ZrTi) and TiCuZr, Project No. N N507 303940), IMIMS PAS, participant, 2011-2013

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Thermodynamic properties of the phase diagram of the Ag-Bi-Cu alloy, Juventus Plus, IP 2011 012571, participant, (2012-2014).

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Microstructural and kinetic characterization of the phenomena occurring at the solder/substrate interfaces of the Ti-6Al-4V alloys brazed with the use of amorphous TiZrCuPd ribbons, Project NCN, No UMO-2013/11/B/ST8/04286, supervisor

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Periodic layers structure formation in the solid state reactions in systems Mg/SiO₂, Zn/Co₂Si and Zn/Ni₃Si, Project NCN, No (2014/15/B/ST8/00195, participant (2015-2018)

European Union Projects

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Operational Programme Innovative Economy, co-financed by European Cohesion Funds, Reliability improvement of lead-free interconnections in electronic packages, (POIG.01.03.01-00-103/09), task manager (2010-2013)

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ZAMAT. Advanced materials and their production technologies, Advanced materials and their production technologies. Project jointly financed by European Union and Poland, POIG.01.01.02- 00-015/09-00, IMMS PAS, participant, 2010-2013

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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, INFRASTRUKTURA, POIG.02.01.00-12-175/09-02, participant, 2011-2014,

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„In-line processing of n+/p and p/p+ junction systems for cheap photovoltaic module production", 1.01.2014 - 31.12.2016, Project No POL-NOR/199380/89/2014 NCBiR, participant, (2014-2016)

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„Nowoczesne zawierające grafen kompozyty na bazie miedzi i srebra przeznaczone dla przemysłu energetycznego i elektronicznego. - GRAMCOM, GRAF-TECH, temat: Zastosowanie metody skręcania pod wysokim ciśnieniem do wytwarzania kompozytów grafenowych na styki elektryczne oraz podłoża odprowadzające ciepło", 2013-2015, NCBiR, wykonawca

-

„Opracowanie innowacyjnej metody koagulacji, redukcji i krystalizacji miedzi w żużlach po procesowych" - AWB1-PBS, 2015-2018, NCBiR, wykonawca

-

„Opracowanie technologii wytwarzania komponentu i pasty miedziowej wykorzystywanej w procesie produkcji kontaktów elektrycznych ogni w krzemowych", POIR.01.01.01, 2016-2018, NCBiR, wykonawca

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„Optymalizacja antybakteryjna wysoko odkształczanych stopów tytanu na implanty kręgosłupa i narzędzia chirurgiczne", SPD-BioTribo, 2016-2019, NCBiR, wykonawca

-

„Samoczyszczące, wydajne panele fotowoltaiczne na podłożu elastycznym zintegrowane z ekranem akustycznym i inteligentnym systemem monitorowania", FLEXPVSCREEN, 2017-2021, NCBiR w ramach poddziałania 4.1.1 „Strategiczne programy badawcze dla gospodarki", wykonawca

International exchange programmes

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The influence of large plastic strains on the structure and physical properties of Ni-based intermetallic phases and amorphous alloys Institute of Superplasticity of the Russian Academy of Sciences, Ufa, Russia, participant, 2008-2010

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Amorphous metallic alloys-relaxation, viscous flow, crystallization, mechanical and other properties for their application, Bulgarian Academy of Sciences, prof. Krassimir Russew, participant, 2012-2014.

Experience gained abroad

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France, Institut Polytechnique de Grenoble, scholarship, (1 week), 2002.

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Slovenia, Complex Metallic Alloys: Surfaces and Coatings, Ljubljana, fellwship, (1 week), 2008

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Netherlands, Eindhoven University of Technology, fellowship, (1week), 2011

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Netherlands, Eindhoven University of Technology, fellowship, (1 week), 2012

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Bulgaria, Institute for Metal Science, Equipment and Technologies "Acad. A. Balevski" with Hydroaerodynamics Centre

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BAN, fellowship, (1 week), 2012

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Germany, IFW-Institute for Solid State and Materials Research Dresden, Institute for Complex Materials - Prof. Jürgen Eckert, supervisor-Dr. Mihai STOICA, scholarship, (2 week), 10.2013

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Germany, IFW-Institute for Solid State and Materials Research Dresden, Institute for Complex Materials - Prof. Jürgen Eckert, supervisor-Dr. Mihai STOICA, scholarship, (1 week), 08.2014

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Germany, IFW-Institute for Solid State and Materials Research Dresden, Institute for Complex Materials - Prof. Jürgen Eckert, supervisor-Dr. Mihai STOICA, scholarship, (1 week), 05.2015

Prizes and awards

2008 II place, best poster, International Conference Advanced Processing of Novel Functional Materials - APNFM2008, Drezno, Germany.

2009 III place best poster, European Congress on Advanced Materials and Processes - EUROMAT 2009, Glasgow, Great Britain,

2012 -The Award of the Academy of Sciences IMMS for taking third place in the group of assistant professor in the evaluation of scientific and research achievements for the years 2009-2010,

2013 - financing of the scientific-managing practice in UE country in the frame of the EU Human Capital Operational Programme, UDA>POKL.04.02.00-00-041/11-00

2017 - II place, best poster, XVI International Conference on Electron Microscopy EM2017, Jachranka

Education of scientific staff

Supervisor of 3 thesis - M.Sc.: M. Szewczyk (2001), P. Paszek (2004), K.Badura (2014/2015)

assistant supervisor of Ph.D. P.Bobrowski (2014), Supervisor of PhD student K. Badura (2016-2020)

Reviewer: Ministry of Science and Higher Education and Foundation for Polish Science, The National Centre for Research and Development, National Science Centre, Poland

POIG FORSURF Industry Expert: in the Operational Programme Innovative Economy 2007-2013.

Expert in the Regional Operational Programme for the Małopolska Region for the years 2014-2020.

Laboratory classes for students at AGH- University of Science and Technology, Cracow, Faculty of Metallurgy and Materials Science, 1998-2004.

Organisation of conferences and scientific events

Member of Organizing Committee: TOFA 2008 Discussion Meeting on Thermodynamics of Alloys, Krakow, Poland (2008).

65th Anniversary of IMIM PAN 2017 "65th Anniversary of the Institute of Metallurgy and Materials Science PAN" 26.10.2017, Cracow, member of the organizing committee

Membership in professional societies

Polish Association for Materials Science (since 2005)

European Materials Research Society, Polish Association for Materials Science (since 2007)

APDTC - Associated Phase Diagram and Thermodynamics Committee od 2011
European Microbeam Analysis Society (since 2012)
PTMi - Polish Society of Microscopy (since 2018)

Main scientific interest

New soldering, brazing materials and techniques (magnetic induction, laser welding). Modern methods of the metallic materials preparation (levitation melting, CCLM, rapid solidification). Microstructure characterization using advanced scanning electron microscopy techniques. Fabrication and characterization of amorphous and nanocrystalline materials obtained by rapid solidification methods. Materials Engineering, Amorphous and Nanocrystalline, Materials Bulk Metallic Glasses, Functional, Materials Electron microscopy (SEM, TEM), Thermomechanical Analysis, High Temperature Phases and Alloys.