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Employment and positions

Institute of Metallurgy and Materials Science, Polish Academy of Sciences: Ph.D. studies (2002-2006), assistant professor (2006-2016), specialist for environmental research equipment (2016-2017), professor of Polish Academy of Sciences (from 2018), Accredited Testing Laboratories at the Institute of Metallurgy and Materials Science of the Polish Academy of Sciences, Laboratory of Microcalorimetry, Expert (2005) and Deputy Manager (from 2010).

Scientific Career

M.Sc.: Jagiellonian University, Faculty of Chemistry, 2002

Ph.D.: Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 2006

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

Scientific achievements

Author/co-author of **39** papers and **56** presentations and posters during conferences.

The most relevant publications during last 5 years

1.

Anna Wierzbicka-Miernik, Joanna Wojewoda-Budka, Paweł Zięba: *Morphology and chemical composition of Cu/Sn/Cu and Cu(5at% Ni)/Sn/Cu(5at% Ni) interconnections*, Science and Technology of Welding and Joining, Vol 17 No 1, 32-35, 2012.

2.

R. Filipek, K. Szyszkiewicz, P. Dziembaj, P. Skrzyniarz, **A. Wierzbicka-Miernik**, P. Zięba: Modeling of Reactive Diffusion - Mechanism and Kinetics of the Intermetallics Growth in Ag/Ag Interconnections, Journal of Materials Engineering and Performance. 21(5), 638-647, 2012

3.

A. Wierzbicka-Miernik: Morphology and chemistry characterization of intermetallic phases in (Cu+5at.% Ni)/Sn-Ag-Sn/(Cu+5at.% Ni) interconnections, Inżynieria Materiałowa, 3, 209-211, 2013

4.

A. Wierzbicka-Miernik, K. Miernik, J. Wojewoda-Budka, K. Szyszkiewicz, R. Filipek, L. Lityńska-Dobrzyńska, A. Kodentsov, P. Zieba: Growth kinetics of the intermetallic phase in diffusion-soldered (Cu+5at.%Ni)/Sn/(Cu+5at.%Ni) interconnections, *Materials Chemistry and Physics*, 142(2-3), 682-685, 2013

5.

A. Wierzbicka-Miernik, K. Miernik, J. Wojewoda-Budka, L. Lityńska-Dobrzyńska, G. Garzel: Microstructure and chemical characterization of the intermetallic phases in Cu/(Sn,Ni) diffusion couples with various Ni additions, *Intermetallics*, 59, 23-31, 2015

6.

A. Wierzbicka-Miernik, J. Guspiel, L. Zabdyr: Corrosion behaviour of lead-free SAC-type solder alloys in the liquid media, *Archives of Civil and Mechanical Engineering* 15, 206 - 213, 2015

7.

J. Guśpiel, **A. Wierzbicka-Miernik**, W. Reczyński: Kinetics of corrosion process in H₂SO₄ and HNO₃ aqueous solutions of lead free Sn-Ag-Cu solder alloys, *Archives of Metallurgy and Materials*, nr 2/2016, tom 61 (przyjęte do druku)

8.

Z. Huber, J. Wojewoda-Budka, **A. Wierzbicka-Miernik**, A. Sybien, M. Szczerba, P. Zieba: Influence of phosphorous content on microstructure development at the Ni-P plating/SAC interface, *Electronic Materials Letters* 12(1), 178-185, 2016

9.

J. Wojewoda-Budka, **A. Wierzbicka-Miernik**, L. Lityńska-Dobrzyńska, M. J. Szczerba, M. Mosialek: Microstructure characteristics and phase transformations of the Ni-P and Ni-P-Re electroless deposited coatings after heat treatment, *Electrochimica Acta* 209, 183-191, 2016

10.

A. Wierzbicka-Miernik, J. Wojewoda-Budka, K. Miernik, L. Lityńska-Dobrzyńska, N. Schell: Characteristics of intermetallic phases in Cu/(Sn,Ni) diffusion couples annealed at 220 °C, *Journal of Alloys and Compounds* 693, 1102-1108, 2017

11.

A. Wierzbicka-Miernik, K. Miernik, R. Filipek, K. Szyszkiewicz: Kinetics of intermetallic phases growth and determination of diffusion coefficients in solid-solid state reaction between Cu and (Sn+1at.%Ni) pads, Journal of Materials Science 52, 10533-10544, 2017

Research Projects

National Science Centre

Microstructural and kinetic characterization of the phenomena occurring at interphase boundaries in (Sn,Ni)/Cu diffusion couples, Project No. 2011/03/B/ST8/06158, supervisor, 2012-2016

Characterization of aluminium matrix composites reinforced with quasicrystal particles, Project No. 2011/03/B/ST8/05165, participant, 2012-2015

Influence of the selected alloy additions on the crystallization and mechanical properties of the NiNb(ZrTi) i TiCuZr metallic glasses, Project No. 3039/B/T02/2011/40, participant, 2011-2013

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

Projects from Ministry of Science and Higher Education

Corrosion study of SAC lead-free solders by liquid media (acid rains, sea water), Project No. N507 443732, IMMS PAS, supervisor, 2008-2011

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

European Union Projects

COST - Action 531 - Lead-free solder materials, Task: Diffusion soldering- perspective technology of materials lead-free joining, IMMS PAS, participant, 2002-2006.

COST - Action MP 0602 - Advanced solder materials for high temperature applications - HISOLD, Working group I - Complex study of thermodynamic and physico-chemical properties and structural characteristics of materials for potential use as high-temperature lead-free solders, Project: No. 85/N-COST/2007/0, 2007-2010, IMMS PAS, participant, 2007-2010.

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), participant, 2010-2013.

Experience gained abroad

University of Leeds, Institute of Materials Research, School of Process, Environmental and Materials Engineering, UK 2004 (1 month)

Netzsch Group, Selb, Germany, 2014 (1 week)

Foundry Research Institute, Krakow, Poland, 2016 (3 weeks)

Prizes and awards

2006 - PhD thesis with honour

2007 - Award of Polish Society for Materials for the best PhD thesis in the field of Materials Engineering in 2006

2010 - Award for second place in the Conference AMT 2010 for poster: *Microstructure and chemistry of Cu(Ni)/Sn diffusion couples*

Education of scientific staff

Laboratory classes for students at Mechanical Department of Krakow University of Technology, 2003 - 2006

Training for the staff at the Laboratory of Microcalorimetry in IMMS PAS since 2006

Supervisory of the training at thermal analysis and practice in Materials Science for the second year students of the Advanced Materials and Nanotechnology & Studies in Mathematics and Natural Sciences from the Jagiellonian University in the frame of project no.: POKL.04.01.02-00-168/11 (Task 9, Training Program)

Vice-promoter of PhD student Katarzyna Kubok within her doctoral studies with English language in the IMIM, 2013-2015

Organisation of conferences and scientific events

Member of the Local Organizing Committee: COST Materials Action 531-Lead-free Solder Materials, Joint Working Group Meeting (WG1+WG2), Kraków (2005),

TOFA - Discussion Meeting on Thermodynamics of Alloys, Kraków (2008),

International Meeting: Practical applications of thermal analysis methods in materials Science, Kraków (2012).

Membership in professional societies

The Member of the Scientific Board of the Institute of Metallurgy and Materials Science of the Polish Academy of Sciences, 2007-2014.

The Member of Polish Association for Materials Science (from 2010)

Main scientific interest

Thermal analysis (Differential Thermal Analysis - DTA and Differential Scanning Calorimetry - DSC), thermomechanical analysis (TMA), lead-free solder materials and modern soldering methods.