Katarzyna Skibińska

ABOUT ME

I have a PhD in Materials Engineering and I am experienced in:
- methods of material synthesis: electrodeposition, Atomic Layer Deposition, and Physical Vapour Deposition,
- techniques of material characterization: i.a. SEM, XRD, AFM, Hall measurements, Ellipsometry.

ORCID: 0000-0002-0332-7725
Scopus Author ID: 57204466778
h-index: 6

WORK EXPERIENCE

Researcher
Research and Development Center of Technology for Industry (CBRTP S.A.) [02/01/2023 – 31/12/2023]

City: Cracow

Country: Poland

Specialist in the deposition and characterization of materials for industrial applications in the Laboratory of Nanotechnology.
• Method of the synthesis: Atomic Layer Deposition and Physical Vapour Deposition.
• Analysis of thin films (SEM, Ellipsometry, Reflectometry, Measurements of Hall Effect).

EDUCATION AND TRAINING

PhD studies
AGH University of Science and Technology [01/10/2018 – 19/12/2022]

Address: aleja Adama Mickiewicza 30, 30-059 Cracow (Poland)

Field(s) of study: Materials Engineering

Final grade: Cum Laude

Type of credits: ECTS – **Number of credits:** 36

Thesis: Synthesis of one-dimensional Co - Fe alloy nanostructures for electrocatalytic applications.

During my PhD studies at the Faculty of Non-Ferrous Metals at AGH University of Science and Technology in Cracow, I worked on:
- electrodeposition of metals and alloys,
- production of AAO templates by the two-step anodization method,
- synthesis of 1D nanostructures using AAO templates,
- fabrication of conical structures from the electrolyte containing the addition of crystal growth modifiers,
- measurement of the electrocatalytic properties of the sample towards hydrogen evolution reaction,
- coating analysis (SEM, XRD, XRF, AFM),
- determination of the active surface of the sample.

Master of Engineering
AGH University of Science and Technology [02/2017 - 07/2018]

City: Cracow
Country: Poland
Field(s) of study: Materials Engineering
Type of credits: ECTS - **Number of credits:** 90
Thesis: Modification of electrodeposited cobalt coatings with palladium ions and their electrocatalytic properties.

Engineer's degree
AGH University of Science and Technology [10/2013 - 01/2017]

City: Cracow
Country: Poland
Field(s) of study: Materials Engineering
Type of credits: ECTS - **Number of credits:** 210
Thesis: Electrochemical synthesis of Co-Pd-C alloys for electrocatalytic applications.

Participation in ESONN'2023
[27/08/2023 - 09/09/2023]

City: Grenoble
Country: France
Website: https://www.esonn.fr/
Field(s) of study: SESSION A: Quantum electronics and technologies

1. Participation in 38 hours of lectures from Session A: Quantum electronics and technologies
2. Attendance in 35 hours of the following practical works:
• Fabrication and characterization of photochromic. Dye-Sensitized Solar Cells.
• Chemical synthesis of perovskite nanocrystals, their microscopic and spectroscopic characterization.
• Practical work on Scanning Probe Microscopies: Atomic Force Microscopy (AFM) and Scanning Tunneling Microscopy (STM).
• Growth by van der Waals epitaxy and characterization of two-dimensional transition metal diselenides.
• Capacitor and diode.

Training "X-ray diffraction in theory and practice"
LabSoft [14/06/2023 - 16/06/2023]

City: Łask
Country: Poland

Participation in "Modern directions in Epitaxy"
European Cooperation in Science and Technology [21/06/2022 - 24/06/2022]

City: Lyngby
Country: Denmark

Trainee in Electrodeposition and characterizations (XRD, SEM) of thermoelectric Tin Selenide nanowires
Institut Jean Lamour [01/09/2020 - 31/10/2020]

City: Metz
Country: France

Participation in 4th e-MINDS TRAINING SCHOOL (COST-Mons)
European Cooperation in Science and Technology [18/03/2019 - 23/03/2019]

City: Mons
Country: Belgium

LANGUAGE SKILLS

Mother tongue(s): **Polish**

Other language(s):

English	**Italian**
LISTENING B2 **READING** B2 **WRITING** B2	**LISTENING** A1 **READING** A1 **WRITING** A1
SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2	**SPOKEN PRODUCTION** A1 **SPOKEN INTERACTION** A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Microsoft Office / Zoom / Google Drive / OriginPro (Intermediate) / Basic skills in ImageJ / AutoDESK AutoCAD (Optimal Knowledge) / Basis of Solidworks

PUBLICATIONS

Tuning up catalytical properties of electrochemically prepared nanoconical Co-Ni deposit for HER and OER

[2023]

Applied Surface Science Volume 607, 1 January 2023, 155004

Authors: **Katarzyna Skibińska**, Konrad Wojtaszek, Lukas Krause, Anna Kula, Xuegeng Yang, Mateusz M. Marzec, Marek Wojnicki, Piotr Żabiński

Electrochemical preparation and alkaline water splitting activity of ternary Co–Fe–Mo non-crystalline coatings

[2023]

International Journal of Hydrogen Energy

Authors: D. Kutyła, **K. Skibińska**, M. Wojtysiak, A. Salci, K. Kołczyk-Siedlecka, K. Wojtaszek, M. Wojnicki, P. Żabiński, R. Solmaz

Hydrogen Bubble Size Distribution on Nanostructured Ni Surfaces: Electrochemically Active Surface Area Versus Wettability

[2023]

ACS Appl. Mater. Interfaces 2023, 15, 14, 18290-18299

Authors: L. Krause; **K. Skibińska**; H. Rox; R. Baumann; M. M. Marzec; X. Yang; Gerd Mutschke; P. Żabiński, A. F. Lasagni; K. Eckert

Electrochemistry at Krakowian research institutions

[2023]

Journal of Solid State Electrochemistry volume 27, pages 1675-1685

Authors: **Katarzyna Skibińska**; Piotr Żabiński

On the prospects of magnetic-field-assisted electrodeposition of nano-structured ferromagnetic layers

[2022]

Electrochimica Acta Volume 420, 10 July 2022, 140422

Authors: Mengyuan Huang, **Katarzyna Skibinska**, Piotr Zabinski, Marek Wojnicki, Grzegorz Włoch, Kerstin Eckert, Gerd Mutschke

One-step synthesis of the hydrophobic conical Co-Fe structures-the comparison of their active areas and electrocatalytic properties

[2022]

Electrochimica Acta Volume 415, 20 May 2022, 140127

Authors: **Katarzyna Skibińska**, Kamil Kornaus, Xuegeng Yang, Dawid Kutyła. Marek Wojnicki, Piotr Żabiński

Rhodium-decorated nanoconical nickel electrode synthesis and characterization as an electrochemical active cathodic material for hydrogen production

[2022]

Applied Surface Science Volume 592, 1 August 2022, 153326

Authors: **Katarzyna Skibińska**, Dawid Kutyła, Xuegeng Yang, Lukas Krause, Mateusz M. Marzec, Piotr Żabiński

Hydrogen evolution reaction (HER) activity of conical Co–Fe alloy structures and their application as a sensitive and rapid sensor for H2O2 detection

[2022]

Archives of Civil and Mechanical Engineering volume 22, Article number: 76 (2022)

Authors: **Katarzyna Skibińska**, Dawid Kutyła, Anna Kula, Marta Gajewska, Mateusz M. Marzec, Piotr Żabiński

On the electrodeposition of conically nano-structured nickel layers assisted by a capping agent

[2022]

Journal of Electroanalytical Chemistry Volume 904, 1 January 2022, 115935

Authors: **Katarzyna Skibińska**, Mengyuan Huang, Gerd Mutschke, Kerstin Eckert, Grzegorz Włoch, Marek Wojnicki, Piotr Żabiński

Synthesis and Catalytic Studies of Nanoalloy Particles Based on Bismuth, Silver, and Rhenium

[2022]

Metals 2022, 12(11), 1819

Authors: Wojtaszek Konrad; **Skibińska Katarzyna**; Cebula Filip; Tokarski Tomasz, Escribà-Gelonch Marc; Hessel Volker

Synthesis of conical Co–Fe alloys structures obtained with crystal modifier in superimposed magnetic field

[2021]

Archives of Civil and Mechanical Engineering volume 21, Article number: 165 (2021)

Authors: **Katarzyna Skibińska**, Dawid Kutyła, Karolina Kołczyk-Siedlecka, Mateusz M. Marzec, Piotr Żabiński, Remigiusz Kowalik

Electrocatalytic Properties of Co Nanoconical Structured Electrodes Produced by a One-Step or Two-Step Method

[2021]

Catalysts 2021, 11(5), 544

Authors: **Katarzyna Skibinska**, Karolina Kolczyk-Siedlecka, Dawid Kutyla, Anna Jedraczka, Beata Leszczyńska-Madej, Mateusz M. Marzec, Piotr Zabinski

Synthesis of Co–Fe 1D Nanocone Array Electrodes Using Aluminum Oxide Template

[2021]

Materials 2021, 14(7), 1717

Authors: **Katarzyna Skibińska**, Karolina Kołczyk-Siedlecka, Dawid Kutyła, Marta Gajewska, Piotr Żabiński

The mechanism of adsorption of rh(Iii) bromide complex ions on activated carbon

[2021]

Molecules 2021, 26(13), 3862

Authors: Wojnicki Marek; Krawontka Andrzej; Wojtaszek Konrad; **Skibińska Katarzyna**; Csapó Edit; Pędzich Zbigniew; Podborska Agnieszka; Kwolek, Przemysław

Study on synthesis and modification of conical Ni structures by one-step method

[2021]

Archives of Metallurgy and Materials Volume 66, Issue 3, Pages 861 - 869

Authors: **Skibińska K.**; Semeniuk S.; Kutyła D.; Kołczyk-Siedlecka K.; Jędraczka A.; Żabiński P.

Investigation of Ruthenium Thin Layers Electrodeposition Process under Galvanostatic Conditions from Chloride Solutions

[2020]

Russian Journal of Electrochemistry Volume 56, Issue 3, Pages 214 - 2211 March 2020

Authors: Kutyła D.; Kołczyk K.; Żabiński P.; Kowalik R.; Kwiecińska A.; **Skibinska K.**

Influence of Annealing Time of Aluminum AA1050 on the Quality of Cu and Co Nanocones

[2020]

Journal of Materials Engineering and Performance Volume 29, Issue 12, Pages 8025 - 8035

Authors: **Skibinska Katarzyna**; Smola Grzegorz; Bialo Lukasz; Kutyla Dawid; Kolczyk-Siedlecka Karolina; Kwiecinska Anna; Wojnicki Marek; Zabinski Piotr

Influence of magnetic field on electroless metallization of 3D prints by copper and nickel

[2019]

Arch. Metall. Mater. 64 (2019), 1, 17-22

Authors: K. KOŁCZYK-SIEDLECKA, **K. SKIBIŃSKA**, D. KUTYŁA, A. KWIECIŃSKA, R. KOWALIK, P. ŻABIŃSKI

Electrochemical analysis of co-deposition cobalt and selenium

[2019]

Journal of Electroanalytical Chemistry Volume 848, 1 September 2019, 113278

Authors: Anna Maria Kwiecińska, Dawid Kutyła, Karolina Kołczyk-Siedlecka, **Katarzyna Skibińska**, Piotr Żabiński, Remigiusz Kowalik

Preparation and characterization of electrodeposited Ni-Ru alloys: morphological and catalytic study

[2019]

Journal of Solid State Electrochemistry Volume 23, Issue 11, Pages 3089 - 3097

Author: Kutyła Dawid; Kołczyk-Siedlecka Karolina; Kwiecińska Anna; **Skibińska Katarzyna**; Kowalik Remigiusz; Żabiński Piotr

Electrocatalytical properties of palladium-decorated cobalt coatings obtained by electrodeposition and galvanic displacment

[2018]

Archives of Metallurgy and Materials Volume 63, Issue 3, Pages 1517 - 1521

Authors: **Skibińska K.**; KutyŁa D.; KoŁczyk K.; Kwiecińska A.; Kowalik R.; Zabiński P.

PROJECTS

One-step electrochemical synthesis of Ni-Cu, Cu-Fe, and Ni-Cu-Fe conical structures for electrocatalytic applications

[17/01/2023 – Current]

Head of the project funded by the Polish National Science Centre.

The impact of crystal growth modifiers on the microstructure and chemical composition of Co-Ni catalysts with a conical structure of electrochemically deposited electrochemically

[01/2022 – 11/2022]

Head of the minigrant "The impact of crystal growth modifiers on the microstructure and chemical composition of Co-Ni catalysts with a conical structure of electrochemically deposited electrochemically" financed under the Initiative of Excellence - Research University at the AGH UST (Action 4 "Minigrants for young scientists and doctoral students - 2nd edition"): scientific internship as part of the Minigrant, Technische Universität Dresden, Scientific supervisor: Professor Kerstin Eckert, 20.04-27.04.2022

Determination of ion separation parameters of the liquids after leaching on liquid ion exchangers

[05/2022 – 10/2022]

Scholar in an industrial project.

Development of a methodology for the observation of highly corroded stainless steel sheets by the SEM method

[27/04/2022 – 24/05/2022]

Scholar in an industrial project.

Development of a methodology for the analysis of the composition of metal alloys / chemical compounds obtained as a result of the hydro- and pyrometallurgical process.

[11/2021 – 05/2022]

Scholar in an industrial project.

One-step magnetic field assisted electrodeposition of nano-structures based on CoFe alloy

[01/10/2018 – 31/12/2020]

Scholar in the BEETHOVEN 2 Project (UMO-2016/23/G/ST5/04058) in collaboration with Helmholtz-Zentrum Dresden Rossendorf and Technische Universität Dresden

CONFERENCES AND SEMINARS

15th International Workshop on Electrodeposited Nanostructures (EDNANO)

[Metz, 15/11/2023 – 18/11/2023]

Nanoconical Ni-Cu, Cu-Fe, and Ni-Cu-Fe catalysts electrodeposited by the one-step method (presentation).

12th PAMIR International Conference Fundamental and Applied MHD

[Cracow, 04/07/2022 – 07/07/2022]

Synthesis of conical Co-Fe alloys structures by one- and two-step methods in superimposed magnetic field (presentation).

14th International Workshop on Electrodeposited Nanostructure (EDNANO14)

[Cracow, 09/06/2022 – 11/06/2022]

Nanoconical Co-Fe alloy catalysts synthesized using one- and two-step methods (presentation).

3rd International Workshop on Functional Nanostructured Materials (FuNaM-3)

[Cracow, 06/10/2021 – 08/10/2021]

One-step synthesis of the conical Co–Fe structures the comparison of their active areas and electrocatalytic properties (presentation).

6th International Symposium on Surface Imaging/Spectroscopy at the Solid/Liquid Interface

[Cracow, 06/06/2021 – 09/06/2021]

Influence of superimposed magnetic field on synthesis of conical Co–Fe alloy structures obtained by one-step method (poster).

VII International Conference: Young Researchers' Innovative Ideas: Science | Start-Ups | Industry

[Cracow, 27/05/2021 – 28/05/2021]

Electrocatalytic properties of Co conical structured electrode produced by one-step and two-step method (presen tation).

ANNIC 2021: Applied Nanotechnology and Nanoscience : International Conference

[Online, 24/03/2021 – 26/03/2021]

Electrocatalytic properties of synthesized Co–Fe nanocones obtained using crystal growth modifier with applied, superimposed magnetic field (poster).

1st International Electronic Conference on Catalysis Sciences

[Online, 10/11/2020 – 30/11/2020]

Electrocatalytic properties of Co nanoconical structured electrode produced by one-step and two-step method (poster).

GSSAE 2020 Graduate Student Symposium on Advantageous Electrochemistry

[Online - Warsaw, 10/09/2020 – 11/09/2020]

Influence of magnetic field of Ni nanocones array electrode synthesized using crystal modifier (presentation).

71st Annual Meeting of the International Society of Electrochemistry

[Online - Belgrade, 31/08/2020 – 04/09/2020]

Influence of superimposed magnetic field on Co-Fe alloy 1D nanocone array electrodeposited in AAO template (poster).

Energy Efficient Magnetoelectric Materials by Ionic Approaches: Fundamentals, Challenges and Perspectives : 712. WE-Heraeus-Seminar

[Bad Honnef, 26/01/2020 – 29/01/2020]

Electrodeposition of Co–Fe alloy 1D nanocone array inside AAO template with superimposed magnetic field (poster).

The 3rd International Symposium on Anodizing Science and Technology (AST2019)

[Awaji Island, Hyogo, 02/06/2019 – 05/06/2019]

Synthesis of Co-Fe alloy 1D nanocone array electrodes with aluminum oxide template (presentation).

Satellite Student Regional Symposium on Electrochemistry

[Split, 26/05/2019]

Synthesis of copper 1D nanocone array electrodes using aluminum oxide template (presentation).

2nd International Workshop on Functional Nanostructured Materials (FuNaM-2)

[Cracow, 11/10/2018 – 12/10/2018]

Electrocatalytical properties of palladium - decorated cobalt coatings obtained by electrodeposition and galvanic displacement (poster).

HONOURS AND AWARDS

Scholar in EU Project POWR.03.03.00-IP.08-00-P13/18 PROM NAWA

PROM NAWA [2020]

Scientific internship as part of the NAWA PROM scholarship (POWR.03.03.00-IP.08-00-P13) at the University of Szeged, Hungary; research on the synthesis of gold nanoparticles and the analysis of Cu nanocones by UV-VIS-NIR spectroscopy. Scientific supervisor: Associate Professor Edit Csapó, 20/09/2021 - 26/09/2021

Multiple rector's award for scientific achievements

AGH University and Technology in Cracow

1. One-time scholarship from the Own Fund for scholarships for scientific achievements awarded by the Vice-Rector (23/06/2022 and 04/10/2021).
2. Scholarship for the best PhD students from 01/10/2018 to 31/07/2019.
3. Increase of the scholarship:
   - from 01/10/2021 to 30/09/2022
   - from 01/10/2020 to 30/09/2021
   - from 01/10/2019 to 30/09/2020
   - from 01/10/2018 to 30/09/2019.

SOCIAL AND POLITICAL ACTIVITIES

Host in the BARI programme

[Cracow, 06/2021 – 07/2021]

Participant of the Baltic Science Network Mobility Program for Research Internships 2021, offering, as part of the Kraków_PN_111 project, an internship for Yulia Shavva from Umeå University in Sweden

Chairwoman of the doctoral students' self-government at the Faculty of Non-Ferrous Metals

[AGH University of Science and Technology , 01/2021 – 01/2022]

AGH UST Open Day

[Cracow, 2019 – 2021]

Assistance in organizing the AGH UST Open Day celebration in 2019-2021.

Scientists' Night

[Cracow, 2018 – 2022]

Assistance with the organization of the Night of Scientists in 2018-2022.

NETWORKS AND MEMBERSHIPS

International Society of Electrochemistry

[06/2020 – Current]

Member ID 19518

RECOMMENDATIONS

Supervisor

Name: Piotr Żabiński
Email: zabinski@agh.edu.pl

Professor Piotr Żabiński was my supervisor during my PhD studies. He was also the Head of the BEETHOVEN project, in which I was the scholar.

Scientific collaborator

Name: Kerstin Eckert
Email: k.eckert@hzdr.de

I worked with Professor Kerstin Eckert on the BEETHOVEN project. We have also collaborated after the end of the mentioned project.

HOBBIES AND INTERESTS

Hobbies

Travelling, cooking, and baking.