

CURRICULUM VITAE

Mohamed Barakat Zakaria, PhD.

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Biography: Mohamed Barakat Zakaria earned his PhD in Engineering from Waseda University in Japan in 2016 under supervision of Professor Yusuke Yamauchi. He then did his postdoctoral research at National Institute for Materials Science (NIMS) in Tsukuba/Japan, the University of Queensland/Australia, and Ruhr University of Bochum (RUB)/Germany. In 2024, he joined Illinois Institute of Technology (IIT) as a senior research associate for one year. Mohamed is a recipient of many prestigious awards such as JSPS Fellowship-16F16371/Japan(2016), postdoctoral exchange program-2019M652339/China(2018), IAAM Young Scientist Prestigious Medal/Stockholm(2018), Humboldt Research Fellowship-1211515/Germany(2020), Irish Postdoctoral Fellowship Award/Ireland (GOIPD/2020/283). He has authored 66 original articles, 4 review papers, 4 patents, and 1 book with an h-index of 26 and delivered 35 presentations in international conferences. His research mainly focuses on heterogeneous catalysis and functional/porous materials engineering and chemistry for alkaline water electrolysis, ORR, CO₂RR, N₂RR, and supercapacitors. Additionally, he is interested in the rational design of 2D (Hofmann-type) and 3D porous coordination polymers in nanoscale and investigating their great potential for nanostructured functional inorganic materials for electrocatalysis.

Keywords: Inorganic nanomaterials, mesoporous materials, CPs (PCPs/MOFs), semiconductor oxide thin films, electrocatalysis, alkaline water electrolysis, and H⁺, CO₂, N₂ and O₂ reduction reaction (HER, CO₂RR, NRR and ORR).

Professional experience

1. August 2024 – August 2025: Senior Research Associate

Department of Chemistry, Illinois Institute of Technology, Chicago, IL 60616, USA.

Lead a project on developing of transition metal rich MOFs for the electrochemical carbon dioxide and nitrogen reduction reactions (CO₂RR and N₂RR) and water splitting.

2. January 2022 – Present: Associate Professor of Physical Chemistry

Department of Chemistry, Faculty of Science, Tanta University, 31527 Tanta, Egypt.

Led a project on non-aqueous solutions-driven electrocatalytic nitrogen reduction reaction (EN₂RR) for renewable ammonia production in addition to teaching chemistry.

3. September 2020 – August 2023: Humboldt Fellow

Inorganic Chemistry 1, Ruhr University of Bochum, 44801 Bochum, Germany.

Developed transition metals rich sulfides for alkaline water electrolysis work efficiently at industrial scale. **Supervisor: Prof. Ulf-Peter Apfel**

4. September 2018 – August 2020: Postdoctoral Researcher

Australian Institute for Bioengineering and Nanotechnology (AIBN), The University of Queensland, Australia.

Employed coordination polymers for casting efficient transition metal sulfides nanoflake electrocatalysts for the OER and HER. **Supervisor: Prof. Yusuke Yamachi**

5. September 2016 – September 2018: JSPS Postdoctoral Researcher

International Centre for Materials Nanoarchitectonics (MANA), National Institute for Materials Science, Japan.

Introduced the concept of mesoporous materials to the nanodevices fabrication.

Supervisor: Prof. Toyohiro Chikyow

6. October 2016 – January 2022: Lecturer of Physical Chemistry

Department of Chemistry, Faculty of Science, Tanta University, 31527 Tanta, Egypt.

Teaching and research in physical and inorganic chemistry.

7. March 2011 – September 2016: Assistant Lecturer

Department of Chemistry, Faculty of Science, Tanta University, 31527 Tanta, Egypt.

Teaching and research in physical and inorganic chemistry.

8. March 2008 – February 2011: Demonstrator

Department of Chemistry, Faculty of Science, Tanta University, 31527 Tanta, Egypt.

Teaching and research in physical and inorganic chemistry.

Education

1. July 2016: PhD in Engineering

Graduate School of Advanced Science and Engineering, Waseda University, Tokyo, Japan.

Thesis: Nanostructured metal oxides and carbides via controlled thermal decomposition of cyano-bridged coordination polymers. **Supervisor:** Prof. Yusuke Yamachi

2. **February 2011: MSc. in Physical Chemistry**

Department of Chemistry, Faculty of Science Tanta University, Tanta, **Egypt.**

Thesis: The application of nano materials for corrosion inhibition. **Supervisors:** Prof. El-Zeiny Ebeid and Prof. Mohamed Elmorsi

3. **September 2008: Postgraduate studies**

Department of Chemistry, Faculty of Science Tanta University, Tanta, **Egypt.**

Topic: Inorganic and physical chemistry.

4. **June 2007: BSc. in Chemistry**

Excellent with honors, ranked the first student over 500 students with general grade 86.98%, Department of Chemistry, Faculty of Science, Tanta University, Tanta, **Egypt.**

Granted Fellowships

1. **September 2023 - August 2024**

Humboldt Return Fellowship (Ref 3.4 - 1211515 - EGY - HFST-P), Alexander von Humboldt Foundation (AvH), **Germany.**

2. **September 2020 - August 2023**

Humboldt Research Fellowship (1211515), Alexander von Humboldt Foundation (AvH), **Germany.**

3. **September 2018 - August 2020**

2018 International Postdoctoral Exchange Fellowship, China Postdoctoral Science Foundation (2019M652339), **China-Australia.**

4. **September 2016 - September 2018**

Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship (16F16371), **Japan.**

5. **October 2012- July 2016**

Egyptian government scholarship, the Ministry of Higher Education, **Egypt.**

Awards and honors

1. **September 2024**

Best poster award at the Kilpatrick Lecture Symposium, 4th place, 1st Midwest MOF Conference, Illinois Institute of Technology, Chicago, **USA.**

2. **March 2024**

Outstanding reviewer award for journal of Materials Chemistry A in 2023, **RSC.**

3. **July 2023**

Humboldt Return Fellowship (1211515), Humboldt Foundation (AvH), **Germany**

4. **June 2021 - March 2023**

Visiting researcher, National Institute for Materials Science, **Japan.**

5. **October 2021**

Web of Science mentoring in peer review award, **WOS.**

6. **July 2020**

Government of Ireland Postdoctoral Fellowship (GOIPD/2020/283), IRC, **Ireland.**

7. **March 2020**

Humboldt Research Fellowship (1211515), Humboldt Foundation (AvH), **Germany.**

8. **February 2019**

Outstanding reviewer award for journal of Materials Chemistry A in 2018, **RSC.**

9. **December 2018**

Award of 2018 International Postdoctoral Exchange Program, **China.**

10. **October 2018**

Publons Academy peer reviewer award, **Publons Academy.**

11. **March 2018**

Outstanding reviewer award of Electrochimica Acta in 2018, **Elsevier.**

12. **February 2018**

The prestigious IAAM Young Scientist Medal for 2018, **Sweden.**

13. **August 2017**

Oral presentation nomination on the meeting scene of IUMRS-ICAM 2017, Kyoto University, **Japan.**

14. **July 2016**

Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship Award (16F16371), **Japan.**

15. **October 2015**

Energy & Environmental Science journal best poster award, 2015 MANA-RSC symposium, **Japan.**

16. **June 2015**

APL Materials best poster award, International Conference of Nanospace Materials, **Taiwan.**

17. **January 2015**

Article is featured on the front cover of *Chem. Eur. J.* **2015**, *21*, 3509 and got a hot paper, **WILEY-VCH.**

18. **July 2012**

Egyptian government scholarship award, ministry of higher education (mohe), **Egypt.**

19. **April 2012**

National Institute for Materials Science (NIMS) Scholarship, **Japan.**

20. **Aug. 2011 – Dec. 2011**

Guest scientist, National Institute for Materials Science (NIMS/MANA), **Japan.**

21. **2008**

Student Promotion Award of the Egyptian Syndicate of Scientific Professions, **Egypt.**

22. **2007**

Student Promotion Award of the Faculty of Science, University of Tanta, **Egypt.**

Funding received so far

1. "Non-aqueous Solutions-driven Electrocatalytic Nitrogen Reduction Reaction for Green Ammonia Production", Alexander von Humboldt Foundation (AvH), Project ID: Ref 3.4 - 1211515 - EGY - HFST-P, Germany, 6,500 Euro, September 2023-August 2024. (Principal Investigator).

- “Developing novel 2D and 3D defect-free cyano-bridged coordination polymers-based carbon/MXene materials for next-generation sodium-ion batteries and electrochemical applications”, Alexander von Humboldt Foundation (AvH), Project ID: 1211515, Germany, 19,000 Euro, September 2020-August 2022. (Principal Investigator).
- “Polymer functionalization of carbon-based materials for heterogeneous catalysis: CO₂ conversion, water electrolysis, and fuel cell applications”, Jouf University, Sakaka, Saudi Arabia, 100,000 SAR, December 2020-November 2021. (Co-Investigator).
- “Modification of commercial kits for DNA quantification and sequences using fluorescent dyes and nanoparticles”, Tanta University, Tanta, Egypt, 750,000 EGP, September 2019-August 2021. (Co-Investigator).
- “Design of coordination polymers and their derivatives toward electric applications”, Australian Institute for Bioengineering and Nanotechnology (AIBN), the University of Queensland, Australia, October 2018-August 2020. (Principal Investigator).
- “Development of some novel hierarchical nanoporous materials for construction low-cost and high-efficiency fuel cell devices as clean renewable energy sources”, University of Jeddah, Jeddah, Saudi Arabia, 120,000 SAR, May 2019-April 2020. (Co-Investigator).
- “Developing efficient cathodes for next generation of sodium-ion batteries using defect-free Prussian blue and its analogues”, International Exchange Program, The Office of China Postdoctoral Council, China Postdoctoral Science Foundation, Project ID: 2019M652339, China, 80,000 Yuan, September 2018-August 2019. (Principal Investigator).
- “New functional materials design by mesoporous materials and its application to nano device”, KAKENHI, Japan Society for the Promotion of Science (JSPS), Project ID: 16F16371, Japan, 3,600,000.00 yen, September 2016-September 2018. (Principal Investigator).
- Full fellowship and mission awarded by the Ministry of Higher Education, Egyptian Government, Egypt for doing my PhD at Waseda University in Japan, July 2012-July 2016. (Scholarship)
- NIMS-Waseda Joint Researcher Scholarship awarded by National Institute for Materials Science, Tsukuba, Japan, September 2012-September 2015. (Scholarship).
- “Synthesis of functional mesoporous materials”, World Premier International (WPI) Center for Materials Nanoarchitectonics (MANA) and National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Japan, August 2011-December 2011. (Internship)
- “Synthesis and applications of mesoporous materials”, Invited by Prof. Yusuke Yamauchi, World Premier International (WPI) Center for Materials Nanoarchitectonics (MANA) and National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Japan, April 21-27, 2012. (Internship)
- “The application of some nanomaterials for the conversion of light into energy”, Invited by Prof. Yusuke Yamauchi, World Premier International (WPI) Center for Materials Nanoarchitectonics (MANA) and National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Japan, April 16-22, 2011. (Internship).

List of Peer-Reviewed Published Original Articles

- H. M. El-Bery, M. M. Abdel Naby, G. G. Mohamed, M. E. El-Khouly, **Mohamed B. Zakaria**,* Enhancing Photocatalytic Hydrogen Generation on TiO₂ Using Thermally Derived Nickel-based Cocatalysts from Hofmann-type Cyanide Coordination Polymer Flakes, *Int. J. Hydrogen Energy*, 78, 470-480, **2024**.
- E. Aboelazm, C. S. Khe, S. Grätz, K. F. Chong, M. S. M. Saheed, **Mohamed B. Zakaria**,* Layered Construction of Integrated Sulfur-bridged CoNi-S/rGO Architecture for Enhanced Electrochemical Energy Storage, *Chem. Eng. J.*, 490, 151557, **2024**.
- M. Billah, Y. Terasawa, M. K. Masud, T. Asahi, **Mohamed B. Zakaria**, T. Nagata, T. Chikyow, F. Uesugi, Md. S. A. Hossain, Y. Yamauchi, Giant Piezoresponse in Nanoporous (Ba,Ca)(Ti,Zr)O₃ Thin Film, *Chem. Sci.*, 15, 9147-9154, **2024**.
- Mohamed B. Zakaria**, J. Zander, M. Weiss, C. Simon, P. Gerschel, S. A. Sanden, M. Smialkowski, D. Tetzlaff, T. Kull, R. Marschall, U.-P. Apfel, FeNi₂S₄—A Potent Bifunctional Efficient Electrocatalyst for the Overall Electrochemical Water Splitting in Alkaline Electrolyte, *Small*, 2311627, 2311627, **2024**.
- E. Aboelazm, C. S. Khe,* K. F. Chong, M. S. M. Saheed, **Mohamed B. Zakaria**,* Interconnected CoNi-Se Hollow Flakes through Reduced Graphene Oxide Sheets as a Cathode Material for Hybrid Supercapacitors, *ACS Appl. Mater. Interfaces*, 16, 15011–15022, **2024**.
- M. M. Abdel Naby, **Mohamed B. Zakaria**,* H. M. El-Bery, G. G. Mohamed, M. E. El-Khouly,* Two-dimensional Nickel Cyano-Bridged Coordination Polymer Thermally Derived Potent Electrocatalysts for Alkaline Hydrogen Evolution Reaction, *J. Mater. Chem. A*, 11, 24261-24271, **2023**.
- Mohamed B. Zakaria**, L. Bahri, D. Tetzlaff, S. Sanden, U.-P. Apfel, Silicon Atom Doping in Heterotrimetallic Sulfides for Non-noble Metal Alkaline Water Electrolysis, *Energy Adv.*, 2, 1190-1203, **2023**.
- E. Aboelazm, C.S. Khe, M.F. Shukur, K. F. Chong, M.S. Saheed, **Mohamed B. Zakaria**,* Synergistic nanostructuring of CoNi-carbide/reduced graphene oxide derived from porous coordination polymers for high-performance hybrid supercapacitors, *J. Energy Storage*, 72, 108580, **2023**.
- Mohamed B. Zakaria**, A. A. Belik, T. Nagata, A. Khalil, T. Chikyow, The Non-innocent Role of Cobalt in

Manipulating the Magnetic and Electric Properties of Mesoporous Silica Thin Films, *Microporous Mesoporous Mater.*, 359, 112661, 2023.

10. **Mohamed B. Zakaria**, K. Harrath, D. Tetzlaff, M. Smialkowski, D. Siegmund, J. Li, R. Cao, U.-P. Apfel, Boosting the Overall Electrochemical Water Splitting Performance of Pentlandites Through Non-metallic Heteroatom Incorporation, *iScience*, 25, 105148, 2022.
11. **Mohamed B. Zakaria**, M. R. Berber, Y. Yamauchi, A. Pakdel, R. Cao, U.-P. Apfel, Synergistic Electrocatalytic Hydrogen Evolution in Ni/NiS Nanoparticles Wrapped in Multi-heteroatom-doped Reduced Graphene Oxide Nanosheets, *ACS Appl. Mater. Interfaces*, 13, 29, 34043–34052, 2021.
12. M. R. Berber, M.S. Ismail, M. Pourkashanian, **Mohamed B. Zakaria**, U.-P. Apfel, A promising Membrane for Polymer Electrolyte Fuel Cells Shows Remarkable Proton Conduction Over Wide Temperature and Humidity Ranges, *ACS Appl. Polym. Mater.*, 2021.
13. C. Simon, **Mohamed B. Zakaria**, H. Kurz, D. Tetzlaff, A. Blösser, M. Weiss, J. Timm, B. Weber, U.-P. Apfel, R. Marschall, Magnetic NiFe₂O₄ Nanoparticles Prepared via a Non-aqueous Microwave-assisted Synthesis for Application in Electrocatalytic Water Oxidation, *Chem. Eur. J.*, 2021.
14. A. Azhar, J. Earnshaw, **Mohamed B. Zakaria**, P. Cheng, Y. V. Kaneti, M. S. A. Hossain, S. M. Alshehri, T. Ahamad, Y. Yamauchi, J. Na, Fabrication and Characterization of Prussian Blue-Derived Iron Carbide-Iron Oxide Hybrid on Reduced Graphene Oxide Nanosheets, *KONA Powder Part. J.*, 38, 260-268, 2021.
15. A. EL-Mahdy, **Mohamed B. Zakaria**, H.-X. Wang, T. Chen, Y. Yamauchi, S.-W. Kuo, Heteroporous Bifluorenylidene-based Covalent Organic Frameworks Displaying Exceptional Dye Adsorption Behavior and High Energy Storage, *J. Mater. Chem. A*, 8, 25148-25155, 2020.
16. A. Najib, M. Iqbal, **Mohamed B. Zakaria**, S. Shoji, Y. Cho, X. Peng, S. Ueda, A. Hashimoto, T. Fujita, M. Miyauchi, Y. Yamauchi, H. Abe, Active Faceted Nanoporous Ruthenium for Electrocatalytic Hydrogen Evolution, *J. Mater. Chem. A*, 8, 19788-19792, 2020.
17. **Mohamed B. Zakaria**, D. Zheng, U.-P. Apfel, T. Nagata, E. S. Kenawy, J. Lin, Dual-Heteroatoms-Doped Reduced Graphene Oxide Sheets Conjoined CoNi-Based Carbide and Sulfide Nanoparticles for Efficient Oxygen Evolution Reaction, *ACS Appl. Mater. Interfaces*, 12, 3269-3276, 2020.
18. **Mohamed B. Zakaria**, Y. Guo, J. Na, R. Tahawy, T. Chikyow, W. A. El-Said, D. A. El-Hady, W. Alshitari, Y. Yamauchi, J. Lin, Layer-by-Layer Motif Heteroarchitecturing of N, S-Co-doped Reduced Graphene Oxide Wrapped Ni/NiS Nanoparticles for Electrochemical Oxidation of Water, *ChemSusChem*, 13, 3269-3276, 2020.
19. E. Kenawy, N. O. Shaker, M. Azaam, A. Lasheen, J. Lin, **Mohamed B. Zakaria**,* Montmorillonite Intercalated Norfloxacin and Tobramycin for New Drug-Delivery Systems, *J. Nanosci. Nanotechnol.*, 20, 5246-5251, 2020.
20. Wael A. Amer, J. Wang, B. Ding, T. Li, A. Abdelaal, **Mohamed B. Zakaria**, J. Henzie, Y. Yamauchi, Physical Expansion of Layered Graphene Oxide Nanosheets using MOF-CVD and Their Thermal Conversion into Nitrogen-Doped Porous Carbons for Supercapacitor Applications, *ChemSusChem*, 13, 1629-1636, 2020.
21. **Mohamed B. Zakaria**,* T. Nagata, T. Chikyow, Mesostructured HfO₂/Al₂O₃ Composite Thin Films with Reduced Leakage Current for Ion Conducting Devices, *ACS Omega*, 4, 14680-14687, 2019.
22. **Mohamed B. Zakaria**, V. Malgras, T. Nagata, J. Kim, Y. Bando, A. Fatehmulla, A. M. Aldhafiri, W. A. Farooq, Y. Jikihara, T. Nakayama, Y. Yamauchi, J. Lin, Gold Nanoparticles Anchored on Mesoporous Zirconia Thin Films for Efficient Catalytic Oxidation of Carbon Monoxide at Low Temperatures, *Microporous Mesoporous Mater.*, 288, 109530, 2019.
23. A. Alowasheer, **Mohamed B. Zakaria**,* Jianjian Lin, A. A. Alshehri, Y. G. Alghamidi, K. A. Alzahrani, Y. V. Kaneti, Y. Yamauchi, In-Situ Formation of Cu-Ni Cyano-Bridged Coordination Polymer on Graphene Oxide Nanosheets and Their Thermal Conversion, *Microporous Mesoporous Mater.*, 290, 109670, 2019.
24. A. Alowasheer, **Mohamed B. Zakaria**, J. Kim, J. Na, Y. V. Kaneti, Y. Bando, Y. Yamauchi, J. Lin, Single crystal growth of two-dimensional cyano-bridged coordination polymer of [Co(H₂O)₂Ni(CN)₄]·4H₂O using trisodium citrate dihydrate, *Bull. Chem. Soc. Jpn.*, 92, 1263-1267, 2019.
25. A. Alowasheer, Y. Yamauchi, A. E. Allah, Z. A. Alothman, A. Y. Badjah, M. Naushad, M. Habila, S. Wabaidur, J. Wang, **Mohamed B. Zakaria***, Nanoporous Iron Oxide/Carbon Composites through In-Situ Deposition of Prussian Blue Nanoparticles on Graphene Oxide Nanosheets and Subsequent Thermal Treatment for Supercapacitor Applications, *Nanomaterials*, 9, 776, 2019.
26. **Mohamed B. Zakaria**,* A. A. Belik, T. Nagata, T. Takei, S. Tominaka, T. Chikyow, Molecular Magnetic Thin Films Made from Ni-Co Prussian Blue Analogues Anchored on Silicon Wafers, *J. Magn. Magn. Mater.*, 486, 165276, 2019.
27. **Mohamed B. Zakaria**, H. Tan, J. Kim, A. Y. Badjah, M. Nushad, M. Habila, S. Wabaidur, Z. A. Alothman, Y. Yamauchi, J. Lin, Structurally Controlled Layered Ni₃C/Graphene Hybrids Using Cyano-Bridged Coordination Polymers, *Electrochem. commun.*, 100, 74-80, 2019.
28. S. Tanaka, **Mohamed B. Zakaria**, Y. V. Kaneti, Y. Jikihara, T. Nakayama, M. Zaman, Y. Bando, M. S. A. Hossain, D. Golberg, Y. Yamauchi, Gold-Loaded Nanoporous Iron Oxide Cubes Derived from Prussian Blue as Carbon Monoxide Oxidation Catalyst at Room Temperature, *ChemistrySelect*, 3, 13464-13469, 2018.
29. A. Azhar, **Mohamed B. Zakaria**,* J. Lin, T. Chikyow, D. J. Martin, Y. G. Alghamdi, A. A. Alshehri, Y. Bando,

- M. S. A. Hossain, K. C. W. Wu, A. K. Nanjundan, Y. Yamauchi, Graphene-Wrapped Nanoporous Nickel-Cobalt Oxide Flakes for Electrochemical Supercapacitors, *ChemistrySelect*, 3, 8505-8510, **2018**.
30. A. Azhar, **Mohamed B. Zakaria**,* E. M. Ebeid, T. Chikyow, Y. Bando, A. A. Alshehri, Y. G. Alghamdi, A. K. Nanjundan, J. Lin, H. Kim, Y. Yamauchi, Synthesis of Hollow Co-Fe Prussian Blue Analogue Cubes by using Silica Spheres as a Sacrificial Template, *ChemistryOpen*, 7, 599-603, **2018**.
 31. R. R. Salunkhe, J. Wang, A. Azhar, J. Lin, V. Malgras, Y. Bando, **Mohamed B. Zakaria**,* A. Ali Alshehri, J. Kim, Y. Yamauchi, K. C.-W. Wu, Three-Dimensional Macroporous Graphitic Carbon for Supercapacitor Application, *ChemistrySelect*, 3, 4522-4526, **2018**.
 32. S. Tanaka, J. Lin, Y. V. Kaneti, S. Yusa, Y. Jikihara, T. Nakayama, **Mohamed B. Zakaria**,* A. A. Alshehri, J. You, M. S. A. Hossain, Y. Yamauchi, Gold nanoparticles supported on mesoporous iron oxide for enhanced CO oxidation reaction, *Nanoscale*, 10, 4779-4785, **2018**
 33. K. Kani, **Mohamed B. Zakaria**,* A. A. Alshehri, J. Kim, J. You, Md S. A. Hossain, B. Jiang, Y. Yamauchi, Synthesis and Characterization of Dendritic Pt Nanoparticles by Using Cationic Surfactant, *Bull. Chem. Soc. Jpn.* 91, 1333-1336, **2018**.
 34. **Mohamed B. Zakaria**,* T. Nagata, A. Matsuda, Y. Yasuhara, A. Ogura, Y. Yamauchi, T. Chikyow, Chemical Synthesis of Multilayered Nanostructured Perovskite Thin Films with Dielectric Features for Electric Capacitors, *ACS Appl. Nano Materials*, 1, 915-921, **2018**.
 35. **Mohamed B. Zakaria**,* E. M. Ebeid, M. M. Abdel-Galil, T. Chikyow, Cyanide bridged coordination polymer nanoflakes thermally derived Ni₃C and fcc-Ni nanoparticles for electrocatalysts, *New. J. Chem.*, 41, 14890, **2017**.
 36. **Mohamed B. Zakaria**,* T. Chikyow, Synergetic nanoporous Mn-Ru oxides as efficient electrocatalysts for the oxygen reduction reaction, *New. J. Chem.*, 41, 8196-8202, **2017**.
 37. S. Tanaka, R. R. Salunkhe, Y. V. Kaneti, V. Malgras, S. M. Alshehri, T. Ahamad, **Mohamed B. Zakaria**,* Y. Yamauchi, M. S. A. Hossain, Prussian blue derived iron oxide nanoparticles wrapped in graphene oxide sheets for electrochemical supercapacitors, *RSC Adv.*, 7, 33994-33999, **2017**.
 38. D. S. Kim,[#] **Mohamed B. Zakaria**,[#] M.-S. Park, A. Alowasheir, S. Alshehri, Y. Yamauchi, H. Kim, Dual-textured Prussian Blue nanocubes as sodium ion storage materials, *Electrochem. Acta*, 240, 300-306, **2017**. [#]equal contribution.
 39. **Mohamed B. Zakaria**, Md. S. A. Hossain, M. J. A. Shiddiky, M. Shahabuddin, E. Yanmaz, J. H. Kim, A. A. Belik, Y. Ide, M. Hu, S. Tominaka, Y. Yamauchi, Cyano-Bridged Trimetallic Coordination Polymer Nanoparticles and Their Thermal Decomposition into Nanoporous Spinel Ferromagnetic Oxides, *Chem. Eur. J.*, 22, 15042, **2016**.
 40. **Mohamed B. Zakaria**, C. Li, Q. Ji, B. Jiang, S. Tominaka, Y. Ide, J. P. Hill, K. Ariga, Y. Yamauchi, Self-Construction from 2D to 3D: One-Pot Layer-by-Layer Assembly of Graphene Oxide Sheets Held Together by Coordination Polymers, *Angew. Chem. Int. Ed.*, 55, 8426-8430, **2016**.
 41. **Mohamed B. Zakaria**, C. Li, Q. Ji, B. Jiang, S. Tominaka, Y. Ide, J. P. Hill, K. Ariga, Y. Yamauchi, Self-Construction from 2D to 3D: One-Pot Layer-by-Layer Assembly of Graphene Oxide Sheets Held Together by Coordination Polymers, *Angew. Chem.*, 128, 8566-8570, **2016**.
 42. **Mohamed B. Zakaria**, C. Li, M. Pramanik, Y. Tsujimoto, M. Hu, V. Malgras, S. Tominaka, Y. Yamauchi, Nanoporous Mn-based electrocatalysts through thermal conversion of cyano-bridged coordination polymers toward ultra-high efficiency hydrogen peroxide production, *J. Mater. Chem. A* 4, 9266-9274, **2016**.
 43. Y. Kamachi,[#] **Mohamed B. Zakaria**,[#] N. L. Torad, T. Nakato, T. Ahamad, S. M. Alshehri, V. Malgras, Y. Yamauchi, Hydrogels containing Prussian blue nanoparticles toward removal of radioactive cesium ions, *J. Nanosci. Nanotechnol.*, 16, 4200-4204, **2016**. [#]equal contribution.
 44. **Mohamed B. Zakaria**, Nanostructuring of nanoporous iron carbide spheres via thermal degradation of triple-shelled Prussian blue hollow spheres for oxygen reduction reaction, *RSC Adv.*, 6, 10341-10351, **2016**.
 45. **Mohamed B. Zakaria**, M. A. Elmorsi, E. M. Ebeid, Nanostructured TiO₂ coated stainless steel for corrosion protection, *J. Nanosci. Nanotechnol.*, 16, 9215-9222, **2016**.
 46. **Mohamed B. Zakaria**, M. Hu, R. R. Salunkhe, M. Pramanik, K. Takai, V. Malgras, S. Choi, S. X. Dou, J. H. Kim, M. Imura, S. Ishihara, Y. Yamauchi, Controlled Synthesis of Nanoporous Nickel Oxide with Two-Dimensional Shapes through Thermal Decomposition of Metal-Cyanide Hybrid Coordination Polymers, *Chem. Eur. J.*, 21, 3605-3612, **2015**.
 47. **Mohamed B. Zakaria**, Mohamed A. Elmorsi, El-Zeiny M. Ebeid, Corrosion Protection of Aluminum Metal Using MCM-41 Films Supported by Silver Nanoparticles and Distyrylpyrazine Photopolymer, *Adv. Sci. Eng. Med.*, 7, 423-428, **2015**.
 48. **Mohamed B. Zakaria**, A. A. Belik, C.-H. Liu, H.-Y. Hsieh, Y.-T. Liao, V. Malgras, Y. Yamauchi, K. C.-W. Wu, Prussian Blue Derived Nanoporous Iron Oxides as Anticancer Drug Carriers for Magnetic-Guided Chemotherapy, *Chem. Asian J.*, 10, 1457-1462, **2015**.
 49. **Mohamed B. Zakaria**, M. Hu, M. Pramanik, C. Li, J. Tang, A. Aldalbahi, S. M. Alshehri, V. Malgras, Y. Yamauchi, Synthesis of Nanoporous Ni-Co Mixed Oxides by Thermal Decomposition of Metal-Cyanide Coordination Polymers, *Chem. Asian J.*, 10, 1541-1545, **2015**.
 50. R. R. Salunkhe, **Mohamed B. Zakaria**, Y. Kamachi, S. M. Alshehri, T. Ahamad, N. L. Torad, S. X. Dou, J. H.

- Kim, Y. Yamauchi, Fabrication of Asymmetric Supercapacitors Based on Coordination Polymer Derived Nanoporous Materials, *Electrochimica. Acta*, 183, 94-99, **2015**.
51. **Mohamed B. Zakaria**, V. Malgras, T. Takei, C. Li, Y. Yamauchi, Layer-by-layer motif hybridization: nanoporous nickel oxide flakes wrapped into graphene oxide sheets toward enhanced oxygen reduction reaction, *Chem. Commun.*, 51, 16409-16412, **2015**.
 52. G. Darabdhara, M. A. Amin, G. A. M. Mersal, E. M. Ahmed, M. R. Das, **Mohamed B. Zakaria**, V. Malgras, S. M. Alshehri, Y. Yamauchi, S. Szunerits, R. Boukherroub, Reduced graphene oxide nanosheets decorated with Au, Pd and Au-Pd bimetallic nanoparticles as highly efficient catalysts for electrochemical hydrogen generation, *J. Mater. Chem. A*, 3, 20254-20266, **2015**.
 53. **Mohamed B. Zakaria**, M. Hu, N. Hayashi, Y. Tsujimoto, S. Ishihara, M. Imura, N. Suzuki, Y.-Y. Huang, Y. Sakka, K. Ariga, Kevin C.-W. Wu, Y. Yamauchi, Thermal conversion of hollow Prussian blue nanoparticles into nanoporous iron oxides with crystallized hematite phase, *Eur. J. Inorg. Chem.*, 1137-1141, **2014**.
 54. **Mohamed B. Zakaria**, M. Hu, Y. Tsujimoto, Y. Sakka, N. Suzuki, Y. Kamachi, M. Imura, S. Ishihara, K. Ariga, Y. Yamauchi, Controlled Crystallization of Cyano-Bridged Cu-Pt Coordination Polymers with Two-Dimensional Morphology, *Chem. Asian J.*, 9, 1511-1514, **2014**.
 55. **Mohamed B. Zakaria**, H. Ming, M. Imura, R. R. Salunkhe, N. Umezawa, H. Hamoudi, A. A. Belik, Y. Yamauchi, Single-Crystal-like Nanoporous Spinel Oxides: A Strategy for Synthesis of Nanoporous Metal Oxides Utilizing Metal-Cyanide Hybrid Coordination Polymers, *Chem. Eur. J.*, 20, 17375 -17384, **2014**.
 56. **Mohamed B. Zakaria**, N. Suzuki, N. L. Torad, M. Matuura, K. Maekawa, H. Tanabe, Y. Yamauchi, Preparation of Mesoporous Titania Thin Films with Well-Crystallized Frameworks by Using Thermally Stable Triblock Copolymers, *Eur. J. Inorg. Chem.*, 2330-2335, **2013**.
 57. Norihiro Suzuki, **Mohamed B. Zakaria**, Nagy L. Torad, Kevin C.-W. Wu, Yoshihiro Nemoto, Masataka Imura, Minoru Osada, Y. Yamauchi, Synthesis of Highly Strained Mesoporous SrTiO₃/BaTiO₃ Composite Films with Robust Ferroelectricity, *Chem. Eur. J.*, 19, 4446-4450, **2013**.
 58. **Mohamed B. Zakaria**, N. Suzuki, K. Shimasaki, N. Miyamoto, Y. T. Huang, Y. Yamauchi, Synthesis of Mesoporous Titania Nanoparticles with Anatase Frameworks and Investigation of Their Photocatalytic Performance, *J. Nanosci. Nanotechnol.*, 12, 4502-4507, **2012**.
 59. N. Suzuki, **Mohamed B. Zakaria**, Y. D. Chiang, K. C. W. Wu, Y. Yamauchi, Thermally stable polymer composites with improved transparency by using colloidal mesoporous silica nanoparticles as inorganic fillers, *Phys. Chem. Chem. Phys.*, 14, 7427-7432, **2012**.
 60. Nagy L. Torad, H.-Y. Lian, K. C.-W. Wu, **Mohamed B. Zakaria**, N. Suzuki, S. Ishihara, Q. Ji, M. Matsuura, K. Maekawa, K. Ariga, T. Kimura, Y. Yamauchi, Novel block copolymer templates for tuning mesopore connectivity in cage-type mesoporous silica films, *J. Mater. Chem.*, 22, 20008-20016, **2012**.
 61. **Mohamed B. Zakaria**, M. A. Elmorsi, E. M. Ebeid, Corrosion Inhibition of 304 Stainless Steel, Copper and Nickel Metals Using Mesoporous Silicate (MCM-41) and 2, 5-Distyrylpyrazine Photopolymer, *ECS Trans.*, 33, 227, **2011**.

Proceedings

1. **Mohamed B. Zakaria**,* M. A. Elmorsi, E. M. Ebeid,* Corrosion Inhibition of 304 Stainless Steel, Copper and Nickel Metals Using Mesoporous Silicate (MCM-41) and 2, 5-Distyrylpyrazine Photopolymer, 218th ECS Meeting, D6 - Pits and Pores 4: New Materials and Applications - In Memory of Ulrich Goesele, The Electrochemical Society, Las Vegas, 2010, 79, <https://iopscience.iop.org/article/10.1149/MA2010-02/18/1367>.

Preprints

1. **Mohamed B. Zakaria**, L. Bahri, D. Tetzlaff, S. Sanden, U.-P. Apfel, Silicon Atom Doping in Heterotrimetallic Sulfides for Non-noble Metal Alkaline Water Electrolysis, *Authorea*, **2023**. <https://doi.org/10.22541/au.168438245.55668767/v1>
2. **Mohamed B. Zakaria**, A. A. Belik, T. Nagata, A. Khalil, T. Chikyow, The Non-innocent Role of Cobalt in Manipulating the Magnetic and Electric Properties of Mesoporous Silica Thin Films, *SSRN*, **2023**. <https://dx.doi.org/10.2139/ssrn.4374993>.
3. **Mohamed B. Zakaria**, K. Harrath, D. Tetzlaff, M. Smialkowski, D. Siegmund, J. Li, R. Cao, U.-P. Apfel, Boosting the Overall Electrochemical Water Splitting Performance of Pentlandites Through Non-metallic Heteroatom Incorporation, *SSRN*, **2022**. <https://dx.doi.org/10.2139/ssrn.4134286>.

List of Peer-Reviewed Published Review Articles

1. **Mohamed B. Zakaria**,* F. Hassan, M. Hu, Hofmann-type Cyanide Bridged Coordination Polymers for Advanced Functional Nanomaterials, *Small*, 20, 2311627, **2024**.
2. A. Azhar, Y. Li, Z. Cai, **Mohamed B. Zakaria**,* M. K. Masud, M. S. A. Hossain, J. Kim, W. Zhang, J. Na, Y. Yamauchi, M. Hu, Nanoarchitectonics: A New Materials Horizon for Prussian Blue and Its Analogues, *Bull. Chem. Soc. Jpn.*, 92, 875-904, **2019**.
3. **Mohamed B. Zakaria**,* T. Chikyow, Recent advances in Prussian blue and Prussian blue analogues: synthesis and thermal treatments, *Coord. Chem. Rev.*, 352, 328-345, **2017**.

4. K. Ariga, V. Malgras, Q. Ji, **Mohamed B. Zakaria**, Y. Yamauchi, Coordination nanoarchitectonics at interfaces between supramolecular and materials chemistry, *Coord. Chem. Rev.*, 320-321, 139-152, **2016**.

List of Peer-Reviewed Published Authored Books

1. Thermal Analysis: from introductory fundamentals to recent applications, Elsevier (**2021**), ISBN: 9780323901918. Authors; El-Zeiny M. Ebeid and **Mohamed B. Zakaria**. <https://doi.org/10.1016/C2018-0-04983-X>

Patents

1. [**Title of the invention**] A novel fluorescent dye Tanta DNA Stain 7 for the direct quantitation and qualitative detection of various nucleic acids, 12/03/2023, No. EG/P/2023/407. "*Application stage*"
[**Inventors**] El-Zeiny Mousa Abdel-Fattah Ebeid, Husien Hasanin Al-Ganzoury, Mohamed Barakat Zakaria, Nermeen Salah El-Din Abdelhalem Hafez
[**Organization**] Egyptian Patent Office, Academy of scientific Research & Technology, Arab Republic of Egypt, Ministry of Scientific Research.
2. [**Title of the invention**] Thermal spray gun for suspensions of nanomaterials using combustible gases, 10/11/2022, No. EG/P/2022/1661. "*Application stage*"
[**Inventors**] Mohamed Barakat Zakaria, El-Zeiny Mousa Abdel-Fattah Ebeid
[**Organization**] Egyptian Patent Office, Academy of scientific Research & Technology, Arab Republic of Egypt, Ministry of Scientific Research.
3. [**Title of the invention**] Nickel-based inorganic efficient and cost effective electrocatalysts for hydrogen evolution reaction, 20/11/2022, No. EG/P/2022. "*Application stage*"
[**Inventors**] Mohamed Barakat Zakaria, Manar Mohamed Abdelnaby, Mohamed E. El-Khouly
[**Organization**] Egyptian Patent Office, Academy of scientific Research & Technology, Arab Republic of Egypt, Ministry of Scientific Research.
4. [**Title of the invention**] A novel fluorescent dye Tanta DNA Stain 6 for the direct quantitation and qualitative detection of various nucleic acids, 11/01/2022, No. EG/P/2022/124. "*Application stage*"
[**Inventors**] El-Zeiny Mousa Abdel-Fattah Ebeid, Mohamed Barakat Zakaria, Nermeen Salah El-Din Abdelhalem Hafez Abdallah Magdy Mohamed Ahmed Elwakel, Amany Ashraf Nageb Abdelbar, Noura Mohamed Abdelhakem Elaetfy
[**Organization**] Egyptian Patent Office, Academy of scientific Research & Technology, Arab Republic of Egypt, Ministry of Scientific Research.

Invited presentations

1. FeNi₂S₄—A Potent Bifunctional Efficient Electrocatalyst for the Overall Electrochemical Water Splitting in Alkaline Electrolyte, The 20th Biennial Conference of the Australian Association of von Humboldt Fellows, Thursday 13th Feb 4 pm to Saturday 15th Feb 1 pm, RMIT University, Swanston St, Melbourne, **Australia**.
2. Semiconductor Atom Doping in Heterotrimetallic Pentlandite Electrocatalyst for Non-noble Metal Alkaline Water Electrolysis, 2nd International conference of "Basic Sciences and sustainable development" 7-9 February 2023, South Valley University, Qena, **Egypt**.
3. The Annual Meeting 2022 of the Alexander von Humboldt Foundation, 22-23 June 2022, Lützowplatz 17, 10785 Berlin, **Germany**.
4. Boosting the electrochemical performance of pentlandites through non-metallic heteroatom doping for the overall water splitting, The 4th YMR Day - December 6th, 2021, Ruhr University of Bochum, Bochum, **Germany**.
5. Nanoporous Materials as a Drug vehicles with High Biocompatibility and Controlled Release, the 7th Euro-Mediterranean Conference of Life Sciences, Pharma, and Biomedicine (BioNat-7) Congress during (October 7-8, 2021) in Cairo, **Egypt**.
6. Humboldt New Mobility Conference, 13 and 14 September 2021, con gressa GmbH Verena Häusler, Engeldamm 62, 10179 Berlin, **Germany**.
7. Virtual study tour of the Alexander von Humboldt Foundation, 16. – 20. and 23. – 27. August 2021, Alexander von Humboldt Foundation Sponsorship and Network, Division Conferences, Programme Assistance Jean-Paul-Str. 12, 53173 Bonn, **Germany**.
8. Annual Meeting of the Alexander von Humboldt Foundation, 23 – 24 June 2021, Alexander von Humboldt Foundation, 53173 Bonn, **Germany**.
9. Developing new functional nanomaterials for electrocatalysis, first international conference of basic science and sustainable developments, 27-28 July 2021, Faculty of Science, South Valley University, Qena, **Egypt**.
10. Your guide to a successful research career, first international conference of basic science and sustainable developments, 27-28 July 2021, Faculty of Science, South Valley University, Qena, **Egypt**.
11. Enhanced electrocatalytic hydrogen evolution on synergistic heterostructure: multi-heteroatoms-doped reduced graphene oxide sheets wrapped Ni/NiS nanoparticles, Virtual Meeting of the Alexander von Humboldt Foundation, 18 - 19 November 2020, Martin-Luther-University Halle-Wittenberg, **Germany**.

12. Layer-by-layer assembly of organic-inorganic sheets into well-defined 3D structures for multiple functional hybrids, The 69th Colloid and Interfacial Chemistry Debate, 18-20 September **2018**, Tsukuba University, Tsukuba, **Japan**.
13. Chemical Synthesis of Multilayered Nanostructured Perovskite Thin Films and Investigation of Dielectric Features, Committee member, European Advanced Materials Congress (EAMC), 25-28 March **2018**, Stockholm, **Sweden**.

Organisation of international conferences

1. International Conference Recent Trends in Chemistry, ICRTC, 25-28 April 2017, Hurghada, organizing committee, **Egypt**.

Research interest and skills

1. Heterogeneous catalysis engineering,
2. Inorganic materials doping for boosting their catalytic performance,
3. The overall electrochemical water splitting/water electrolysis
4. The oxygen reduction and evolution reactions (ORRs and OERs),
5. Hydrogen evolution reactions (HERs),
6. The electrochemical nitrogen reduction reaction (EN₂RR),
7. The electrochemical carbon dioxide reduction reaction (CO₂RR),
8. Super- and dielectric capacitors and water electrolyzer assembly and testing,
9. Sol-gel science, films fabrication, and mesoporous materials engineering.

Supervising and mentoring active ities

i) Master Students

1. Nurul Atikah Saiful Bahri, Synthesis of iron oxide nanoparticles for biomedical applications, Master student 2019, Australian Institute for Bioengineering and Nanotechnology, The University of Queensland, Saint Lucia Campus, Brisbane, **Australia**.
2. Muhammad Waziri, Electrocatalytic oxygen evolution (OER) and oxygen reduction (ORR) reactions testing and analysis, Master student 2021, Inorganic Chemistry 1, Ruhr University of Bochum, 44801 Bochum, **Germany**.
3. Ivainesu Makarudze, Nitroconversion: nitrogen reduction reaction (NRR) and ammonia detection, Master student 2021, Inorganic Chemistry 1, Ruhr University of Bochum, 44801 Bochum, **Germany**.
4. Manar Mohamed Abd El Naby, Tuning the catalytically electroactive sites of nickel oxide and chalcogenides for efficient hydrogen evolution reaction, 2022, Faculty of Engineering and Applied Sciences, E-JUST, P.O. Box 179, New Borg El-Arab City, Postal Code 21934, Alexandria, **Egypt**.

ii) PhD Students

1. Eslam Aboelazm, Ni/Co Metal based on Graphene for High-Performance Hybrid Supercapacitors Derived from Cyano-bridged Coordination Polymers, Centre of Innovative Nanostructure and Nanodevices (COINN), Universiti Teknologi PETRONAS, Seri Iskandar, Perak 32610, **Malaysia**.
2. Azhar Alowasheer, Synthesis of Various Shaped Cyano-bridged Coordination Polymers under Controlled Crystallization, School of Advanced Science and Engineering, Waseda University, **Japan**.
3. Shunsuke Tanaka, Design of Nanoarchitected Iron Oxides for Energy and Environmental Applications, Australian Institute of Innovative Materials (AIIM), University of Wollongong, **Australia**.

Teaching Experience

1. **CH1101**: General Chemistry 1, Department of Chemistry, Faculty of Science, Tanta University (2008 - 2011),
2. **CH1202**: General Chemistry 2, Department of Chemistry, Faculty of Science, Tanta University (2008 - 2011),
3. **CH2105**: Analytical Chemistry, Department of Chemistry, Faculty of Science, Tanta University (2008 - 2011),
4. **CH2202**: Kinetic Chemistry, Department of Chemistry, Faculty of Science, Tanta University (2008 - 2011),
5. **CH3202**: Molecular Spectroscopy, Department of Chemistry, Faculty of Science, Tanta University (2008 - 2011),
6. **CH4101**: Experimental Physical Chemistry 1, Department of Chemistry Tanta University (2008-2011),
7. **CH4202**: Experimental Physical Chemistry 2, Department of Chemistry, Tanta University (2016).
8. **CH3143**: Surface Chemistry and Catalysis, Department of Chemistry, Faculty of Science, Tanta University (2023).
9. **CH4127**: Water Treatment, Department of Chemistry, Faculty of Science, Tanta University (2023).
10. **CH4224**: Physical Environmental Chemistry, Department of Chemistry, Tanta University (2023).
11. **CHE2124**: Principles in Physical Chemistry, Department of Chemistry, Tanta University (2024).
12. **CH3212**: Organometallic compounds, Department of Chemistry, Faculty of Science, Tanta University (2024).
13. **CH3280**: Transition Elements, Department of Chemistry, Faculty of Science, Tanta University (2024).

Editorial Board Membership and Experience

1. Review Editor of Fuel Cells, Electrolyzers and Membrane Reactors at Frontiers in Energy Research.
2. Review Editor of Analytical Chemistry at Frontiers in Chemistry.

3. Review Editor of Nanoscience at Frontiers in Chemistry
4. Guest Associate Editor of Nanoscience at Frontiers in Chemistry, mesoporous materials for nano devices.
5. Guest Editor of biocompatible nanostructured inorganic materials, Bioinorganic Chemistry and Applications, Hindawi.
6. Guest Editor production and properties of functional nanomaterials and composites for electrochemical and catalytic applications, Catalysts, MPDI.

Reviewing for the International Peer-reviewed Journals with 277 verified peer-reviews for 35 Journals

1. Outstanding Reviewer of *Journal of Materials Chemistry A* 2018 and 2023, Royal Society of Chemistry (RSC)
2. Outstanding Peer Reviewer of *Electrochimica Acta*, 2018, Elsevier.
3. Peer Reviewer of *Chemical Society Reviews*, *New Journal of Chemistry (NJC)*, *Dalton Transactions*, and *Nanoscale*, Royal Society of Chemistry (RSC).
4. Early Career Researcher Reviewer of *Nature Communication*, Springer Nature.
5. Peer Reviewer of *Journal of the Taiwan Institute of Chemical Engineers (JTICE)*, *Journal of Alloys and Compounds*, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, *Waste Management*, and *Materials Chemistry and Physics*, *Materials Today Sustainability*, Elsevier.
6. Peer Reviewer of *Journal of the American Chemical Society (JACS)*, *Inorganic Chemistry*, *ACS Sustainable Chemistry & Engineering*, *ACS Biomaterials Science & Engineering*, and *ACS applied materials & interfaces*, American Chemical Society (ACS).
7. Peer Reviewer of *Journal of the Electrochemical Society*, IOP publishing.
8. Peer Reviewer of *Journal of Nanoparticle Research*, and *Rare Metals*, Springer Nature.
9. Peer Reviewer of *Materials*, *Nanomaterials*, *Membranes*, *Polymers*, *Liquids*, *Energies*, *Catalysts*, *Micromachines*, *Coatings*, and *Applied Sciences*, MDPI.
10. Peer Reviewer of *ChemCatChem*, *ChemNanoMat*, *Advanced Materials*, and *Small*, WILEY-VCH.
11. Peer Reviewer of *Science and Technology of Advanced Materials*, Taylor & Francis.

Presentation in the International Conferences and Symposiums

1. Rational Design of Robust Nanostructured Inorganic Materials for Electrochemical Applications, 2024 MRS Fall Meeting & Exhibit, December 1-6, 2024, Massachusetts, Boston, **USA**.
2. Efficient and durable alkaline water electrolysis on heterotrimetallic MOF, the Kilpatrick Lecture Symposium, 1st Midwest MOF Conference, Illinois Institute of Technology, 13 September 2024, Chicago, **USA**.
3. Semiconductor Atom Doping in Heterotrimetallic Pentlandite Electrocatalyst for Non-noble Metal Alkaline Water Electrolysis, 16th International conference on materials chemistry (MC16)-Royal Society of Chemistry (RSC) 3-6 July 2023, Dublin, **Ireland**.
4. Cost-effective and efficient heteroatom-doped-pentlandites electrocatalysts for efficient water splitting, ICRTC 2021, International Conference, Faculty of Science, Tanta University, 1-4 October 2021, Sharm El-Sheikh, **Egypt**.
5. Enhanced electrocatalytic activity toward O₂ reduction and evolution reactions and H₂ evolution reaction on heterostructured electrodes, 54. Jahrestreffen Deutscher Katalytiker, 16-19 March 2021 Online Event, at DECHEMA, **Germany**.
6. Efficient heteroatom-doped-pentlandites electrocatalysts for overall water splitting, Catalysis Science & Technology 10th Anniversary Symposium/Virtual, 16 - 17 November 2021, Royal Society of Chemistry (RSC).
7. Synergistic electrocatalytic hydrogen evolution in Ni/NiS nanoparticles wrapped in multi-heteroatom-doped reduced graphene oxide nanosheets, 2-3 March 2021 online, MANA International Symposium 2021 jointly with ICYS, National Institute for Materials Science (NIMS) 1-1 Namiki, Tsukuba, Ibaraki 305-0044, **Japan**.
8. Synergistic electrocatalytic hydrogen evolution on heterostructured organic-inorganic hybrid electrodes, 3rd Young Materials Researchers Day (WiSe20/21), 30 November 2020, Ruhr University of Bochum, **Germany**.
9. Layer-by-Layer Motif Heteroarchitecturing of N, S-Co-doped Reduced Graphene Oxide Wrapped, Ni/NiS towards Water Splitting, 2019 International Conference on Nanospace Materials, Nanoarchitects in Nanospace Materials, 1-4 October **2019**, The University of Queensland, St Lucia Campus, **Australia**.
10. Graphene-CoNi CPs Hybrid Layers Thermally Derived Well-Retained Graphene-Co₂NiO₄ Nanocomposite for Hybrid Supercapacitors, European Advanced Materials Congress (EAMC), 25-28/3/**2018**, Stockholm, **Sweden**.
11. Chemical Synthesis of Multilayered Nanostructured Perovskite Thin Films and Investigation of Dielectric Features, European Advanced Materials Congress (EAMC), 25 - 28 March **2018**, Stockholm, **Sweden**.
12. Formation of Molecular Magnetic Thin Films of Ni-Co Cyano-Bridged Coordination Polymers on Silicon Wafers, MANA International Symposium, 5-7 March **2018**, Epochal Tsukuba, **Japan**.
13. Rational design of Mn-Ru cyano-bridged coordination polymer nanocubes derived well-retained nanoporous Mn-Ru mixed oxides for efficient electrocatalysts, has been accepted for a poster presentation, 5th Nano Today Conference, 6-10 December **2017**, Hawaii, **USA**.
14. Chemical Synthesis of Multilayered Nanostructured Perovskite Thin Films and Investigation of Dielectric Features, 5th Nano Today Conference, 6-10 December **2017**, Hawaii, **USA**.

15. Mesostructured SrTiO₃/BaTiO₃ Hybrid Films by Surfactant-Templated Sol-Gel Pathway with Robust Ferroelectricity, IUMRS-ICAM 2017, 26 August - 1 September **2017**, Kyoto University, Kyoto, **Japan**.
16. Synergetic Nanoporous Mn-Ru Oxides as Efficient Electrocatalysts for Oxygen Reduction Reaction, The 3rd International Symposium on Advanced Inorganic Materials, 3-5 August **2017**, National Institute for Materials Science (NIMS), Namiki 1-1, Tsukuba 305-0044, **Japan**.
17. Nanoporous Mn-Based Electrocatalysts through Thermal Conversion of Cyano-Bridged Coordination Polymers toward Ultra-High Efficient Hydrogen Peroxide Production, International Conference Recent Trends in Chemistry, ICRTC, 25-28 April **2017**, Hurghada, organizing committee, **Egypt**.
18. Self-construction from 2D to 3D: One-pot layer-by-layer (LbL) assembly of Graphene Oxide (GO) sheets held together by coordination polymers, 9th Nano Congress for Next Generation, August 01-02, **2016** Manchester, **UK**.
19. Layer-by-Layer Motif Hybridization: Nanoporous Nickel Oxide Flakes Wrapped into Graphene Oxide Sheets toward Enhanced Oxygen Reduction Reaction, **2015** MANA-RSC symposium: Materials for Energy Generation and Storage, 15-16 October, National Institute for Materials Science (NIMS), Namiki 1-1, Tsukuba, **Japan**.
20. Controlled Synthesis of Nanoporous Nickel Oxides with Two-Dimensional Shapes through Thermal Decomposition of Metal-Cyanide Hybrid Coordination Polymers, the 6th NIMS/MANA-Waseda University International Symposium, 29 July **2015**, Nishi-Waseda Campus, Waseda University, Tokyo, **Japan**.
21. Two-Dimensional Pt/CuO-GO Nanocomposites through Thermal Treatment of Cyano-Bridged Coordination Polymer, the 6th NIMS/MANA-Waseda University International Symposium, 29 July **2015**, Waseda University, Tokyo, **Japan**.
22. Controlled Synthesis of Nanoporous Nickel Oxides with Two-Dimensional Shapes through Thermal Decomposition of Metal-Cyanide Hybrid Coordination Polymers, the 2015 International Conference of the Nanospace Materials, 23-25 June **2015**, Department of Chemistry, National Taiwan University, Taipei, **Taiwan**.
23. Sophisticated Crystallization of Coordination Polymers and Their Thermal Conversion into Nanostructured Metals Oxides, 5th NIMS/MANA-Waseda University International Symposium, 24 March **2014**, NIMS, Tsukuba, **Japan**.
24. Preparation of Cyano-Bridged Coordination Polymers with Well-Defined Shapes and Their Thermal Conversion into Nanoporous Metal Oxides, 8th International Mesostructured Materials Symposium (IMMS), 20-24 May **2013**, Awaji Island, Hyogo, **Japan**.
25. Synthesis of Photoactive Nanoporous Hematite Iron Oxide with Hollow Interiors Using Prussian Blue Coordination Polymers, Waseda-NIMS joint symposium, 11 March **2013**, NIMS, Sengen-site, Tsukuba, **Japan**.
26. Corrosion Inhibition of 304 Stainless Steel, Copper, and Nickel Metals Using Mesoporous Silicate (MCM- 41) and 2, 5- Distyrylpyrazine Photopolymer, ECS 218th meeting, 10-15 October **2010**, Las Vegas, NV, **USA**.
27. Corrosion Inhibition of 304 Stainless Steel, Copper, and Nickel Metals Using Mesoporous Silicate (MCM- 41) and 2, 5- Distyrylpyrazine Photopolymer, 11th International Chemistry Conference in Africa (11 ICCA), 20-23 November **2010**, Sohag University, Luxor, **Egypt**.

Professional Memberships and Activities

1. Member of National Institute for Materials Science (NIMS) Alumni Network, Tsukuba, **Japan**.
2. Member of Japan Society for the promotion of Science Alumni Association of Egypt (JSPSAAE), **Egypt**.
3. Member of the Egyptian Humboldtian Alumni Community, **Egypt**.
4. Member of the Royal Society of Chemistry (RSC), RSC membership ID: 728059
5. Member of the American Chemical Society (ACS), ACS membership ID: 30886693.
6. Member of the JSPS Researchers Network (JSPS-Net) Community, **Japan**.
7. Member of Alumniportal Deutschland Community, **Germany**.
8. Member of International Association of Advanced Materials (IAAM), Linköping, **Sweden**.
9. Member of Egyptian syndicate of scientific professions, **Egypt**.
10. Member of construction and housing society of Tanta University, Tanta, **Egypt**.
11. Member of staff members club, Tanta University, Tanta, **Egypt**.
12. Member of Arab Union of Chemists, **KSA**.
13. Member of African Association of Pure and Applied Chemistry (AAPA), **Egypt**.

Training Sessions and Workshops

1. 28-29 October 2024, “**Lab Safety Fundamentals Course**”, “**Personal Protective Equipment Course (PPE)**”, “**Filling and Maintenance of Liquid Nitrogen Tanks Course**”, “**Compressed Gas Cylinders Course**”, “**Hazardous Chemicals and Waste Management Course**”, “**NEXSA G2 and ESCALAB XPS training**”, Research Safety Team, Northwestern University, Evanston, the **USA**.
2. 01-30 September 2024, “**Diversity & Inclusion compass course-10 modules**”, Illinois Institute of Technology, Chicago, **USA**.
3. 05-12 June 2024, “**Fundamentals of Digital Transformation**”, two modules “**Web Search and Mobile Applications**”, Central Unit of IT Training, FDTC, **Egypt**.

4. 13-15 December 2020, “**Research Integrity - Engineering and Technology**”, epigeum online training, OXFORD University Press, **UK**.
5. 27-29 November 2019, Training session on “**Statistical Analysis for Data by SPSS**”, Tanta University & The International Center for Faculty and Leadership Development (TICFLD) Center of Tanta University, Tanta, **Egypt**.
6. 23-24 November 2019, Training session on “**Communications Skills**”, Tanta University & The International Center for Faculty and Leadership Development (TICFLD) Center of Tanta University, Tanta, **Egypt**.
7. 19-20 November 2019, Training session on “**Quality Standards in Teaching**”, Tanta University & The International Center for Faculty and Leadership Development (TICFLD) Center of Tanta University, Tanta, **Egypt**.
8. 6-7 November 2019, Training session on “**Strategic Planning**”, Tanta University & The International Center for Faculty and Leadership Development (TICFLD) Center of Tanta University, Tanta, **Egypt**.
9. 2-4 November 2019, Training session on “**Student Assessment & Evaluation**”, Tanta University & The International Center for Faculty and Leadership Development (TICFLD) Center of Tanta University, Tanta, **Egypt**.
10. 27-28 October 2019, Training session on “**Effective Presentation Skills**”, Tanta University & The International Center for Faculty and Leadership Development (TICFLD) Center of Tanta University, Tanta, **Egypt**.
11. 01-30 August 2019, “**OHSB04 - Biosafety Training, OHSB03 - Chemical Safety, OHSB07 - Compressed Gases Safety Assessment, OHSB01 - Laboratory Safety, OHSB09 - UQ Annual Fire Safety Training, OHSB08 - UQ Health Safety and Wellness Induction**”, The University of Queensland, Saint Lucia Campus, Brisbane, **Australia**.
12. 21-23 August 2018, Training on using “**Structural analysis, solid-state Nuclear Magnetic resonance (NMR)**”, CUPAL, National Institute for Materials Science, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, **Japan**.
13. 22-24 May 2018, Training on using “**Surface Analysis, Surface Electron Spectroscopy**” National Institute for Materials Science, 1-2-1 Sengen, Tsukuba 305-0047, **Japan**.
14. 13-15 March 2018, Training on using “**Structural analysis, powder diffraction (PD)**”, CUPAL, National Institute for Materials Science, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, **Japan**.
15. 31 January-2 February 2018, Training on using “**Surface Analysis, Scanning Helium Microscope (HIM)**”, CUPAL, National Institute for Materials Science, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, **Japan**.
16. 30 January 2018, I got a **radiation worker license** after getting radiation safety lectures from 10:00 am to 5:00 pm at Institute of Radiation Measurements, Shirakata-Shirane Tokai-mura, Naka-gun, Ibaraki, **Japan**.
17. 24-26 January 2018, Training on using “**Transmission Electron Microscopy (TEM)**”, CUPAL, National Institute for Materials Science, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, **Japan**.
18. 14-16 November 2017, Training on using “**Scanning tunneling microscope (STM)**”, CUPAL, National Institute for Materials Science, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, **Japan**.
19. 25-27 October 2016 Training session on “**Quality standards in the teaching process**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
20. 22-24 October 2016, Training session on “**Effective presentation**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
21. 18-20 October 2016, Training session on “**Management of the research team**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
22. 15-17 October 2016, Training session on “**Financial and legal aspects of university work**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
23. 11-13 October 2016 Training session on “**Communication skills in different types of education**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
24. 8-10 October 2016 Training session on “**Exam systems and evaluation of students**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
25. UNISTRA-NIMS Joint Workshop, January 27, Tue, 2015, WPI-MANA Bld. 1F Auditorium, National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, 305-0044 **Japan**.
26. Materials Phenomena at Small Scale, Swiss-Japanese Nanoscience Workshop, from 9 to 11 October 2013, National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, 305-0044 **Japan**.
27. 1 Aug., 2011-28 Dec. 2011, Practical training sessions for the use of SEM, TEM, SAXS, wide-angle XRD, TG-DTA, DSC, UV/Vis/IR, BET, Raman spectroscopy, FAM, and other common facilities at the National Institute for Materials Science (NIMS), Namiki site, Tsukuba, Ibaraki, Japan under supervision of TSS staff, **Japan**.
28. 28-30 September 2010 Training session on “**Strategic Planning**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
29. 14-16 September 2010 Training session on “**The ethics of scientific research**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
30. 3-5 August 2010 Training session on “**Student Evaluation and Examination Techniques**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
31. 15-16 June 2010 Training session on “**Proposal for postgraduate students**”, Tanta Quality Assurance Center (TQAC), Tanta University, Tanta, **Egypt**.
32. 28-30 October 2008 Training session on “**Time and Meeting Management**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.

33. 23-25 June 2008 Training session on “**Ethical Principles in University Teaching**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.
34. 18-22 June 2008 Training session on “**Teaching with Technology**”, Faculty and Leadership Development (FLD) Center of Tanta University, Tanta, **Egypt**.

Useful Links

Illinois Tech (IIT): <https://www.iit.edu/directory/people/mohamed-barakat-zakaria-mohamed>
 Tanta University: http://tdb.tanta.edu.eg/staff_data/Staff%20Detailed%20Data_en.aspx?MemberID=3435
 Google Scholar: <http://scholar.google.com/citations?hl=en&user=XpPbXcEAAAAJ>
 Scopus: <https://www.scopus.com/authid/detail.uri?authorId=55203349600>
 ResearchGate: <https://www.researchgate.net/profile/Mohamed-Zakaria-29>
 Researcher ID: <http://www.researcherid.com/rid/B-1731-2016>
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 Research map page: <https://researchmap.jp/mbarakat14>
 Humboldt Network: <https://www.humboldt-foundation.de/vernetzen/recherche-im-humboldt-netzwerk/einzelansicht/1211515/dr-mohamed-barakat-zakaria-mohamed>
 JSPS-Net: https://www.jsps-net.jsps.go.jp/mohamed_mohamed

第7333号

学位記

Waseda University

confers upon

MOHAMED, Mohamed Barakat Zakaria

the degree of Doctor of Engineering
 in recognition of having successfully
 fulfilled all the study and research requirements of the
 Graduate School of Advanced Science
 and Engineering
 on the 21st day of July
 in the year Two Thousand and Sixteen.

Kaoru Kamata

K. Kamata
President

MOHAMED, Mohamed Barakat Zakaria

本大学大学院先進理工学研究
 科において所要の研究指導を
 受け博士論文の審査および試
 験に合格したので博士(工学)
 の学位を授与する

2016年7月21日

早稲田大学総長 鎌田 薫