



Mohamed Esmat, Ph.D.

Curriculum vitae (CV)

Current position:

- Assistant Professor, Faculty of Postgraduate Studies for Advanced Sciences (PSAS), Beni-Suef University (BSU), Egypt
- Visiting postdoctoral researcher, Layered Nanochemistry group, MANA, NIMS, Japan

CONTACT INFORMATION

Date of birth	01 May 1990
Nationality	Egyptian
Gender	Male
Current Address	305-0044, NIMS, 1-1 Namiki, Tsukuba, Ibaraki, Japan.
E-mail	mohamed.esmat.wp@alumni.tsukuba.ac.jp Tel. +81 90 6138 6984

EDUCATION

Ph.D. , Materials Science and Engineering, The University of Tsukuba, Japan	2019 – 2022
M.Sc. , Materials Science and Nanotechnology, Beni-Suef University, Egypt	2013 - 2017
B.Sc. , Chemistry (Excellent with honor degree), Minia University, Egypt	2007 - 2011

WORK EXPERIENCE

Visiting Postdoc , National Institute for Materials Science, Japan	07.2024 – present
Assistant Professor , Faculty of Postgraduate Studies for Advanced Sciences (PSAS), Beni-Suef University (BSU), Egypt	04.2023 – present
Postdoctoral researcher , National Institute for Materials Science, Japan	04.2022 – 03.2023
Junior researcher , National Institute for Materials Science, Japan	04.2019 – 03.2022
Research assistant , National Institute for Materials Science, Japan	10.2018 - 12.2018
Visiting researcher , National Institute for Materials Science, Japan	04.2018 - 09.2018
Teaching assistant , Beni-Suef University, Egypt	09.2013 - 03.2018
Research assistant , Advance Materials Division, CMRDI, Egypt	07.2012 – 08.2013

RESEARCH RECORD

Google Scholar: <https://scholar.google.com/citations?user=gocqat0AAAAJ&hl=en>

ORCID: <https://orcid.org/0000-0003-1465-0955>

Citations > 780

h-index = 17.

LIST OF PUBLICATIONS

- (1) Moustafa E.#; **Esmat, M.# (Co-first)**; Iwanade A.; Oishi M.; Nagai T.; Tsunoji N.; Fukata N.; Chaikittisilp W.; Ide Y., 2D-to-1D Conversion of a Layered Sodium Titanate via Rational Framework Splitting for Highly Efficient Cation Exchange, *Small methods*, **2024**, **Accepted**.
- (2) **Esmat, M.**; El-Hosainy, H.; Miyagawa, M.; Takaba, H.; Tsunoji, N.; Ishihara, S.; Ide, Y., Layered silicate exhibiting MOF-like gate opening behaviors in liquid-phase adsorptions: Experimental and theoretical investigations, *ACS Appl. Mater. Interfaces* **2024**, 16(38).
- (3) **Esmat, M.**; Doustkhah, E.; Abdelbar, M.; Tahawy, R.; El-Hosainy, H.; Abdelhameed, M.; Ide, Y.; Fukata, N. Structural Conversion of Cu-Titanate into Photoactive Plasmonic Cu-TiO₂ for H₂ Generation in Visible Light. *ACS Sustain Chem Eng* **2022**, 10 (13).
- (4) **Esmat, M.**; El-Hosainy, H.; Tahawy, R.; Jevasuwan, W.; Tsunoji, N.; Fukata, N.; Ide, Y. Nitrogen Doping-Mediated Oxygen Vacancies Enhancing Co-Catalyst-Free Solar Photocatalytic H₂ Production Activity in Anatase TiO₂ Nanosheet Assembly. *Appl Catal B* **2021**, 285.
- (5) **Esmat, M.**; Mohtasham, H.; Gadelhak, Y.; Mehrebiani, R. T.; Tahawy, R.; Rostamnia, S.; Fukata, N.; Khaksar, S.; Doustkhah, E. 2D Mesoporous Channels of PMO; a Platform for Cluster-like Pt Synthesis and Catalytic Activity in Nitrophenol Reduction. *Catalysts* **2020**, 10 (2).
- (6) **Esmat, M.**; Farghali, A. A.; El-Dek, S. I.; Khedr, M. H.; Yamauchi, Y.; Bando, Y.; Fukata, N.; Ide, Y. Conversion of a 2D Lepidocrocite-Type Layered Titanate into Its 1D Nanowire Form with Enhancement of Cation Exchange and Photocatalytic Performance. *Inorg Chem* **2019**, 58 (12).
- (7) **Esmat, M.**; Farghali, A. A.; Khedr, M. H.; El-Sherbiny, I. M. Alginate-Based Nanocomposites for Efficient Removal of Heavy Metal Ions. *Int J Biol Macromol* **2017**, 102.
- (8) Tahawy, R.; **Esmat, M.**; El-Hosainy, H.; Farghaly, F. E.; Abdel-Aal, E.-S. A.; El-Hosiny, F. I.; Ide, Y. A Layered Titanate Nanowire Helps Pt/TiO₂ Photocatalyst for Solar Hydrogen Evolution from Water with High Quantum Efficiency. *Bull Chem Soc Jpn* **2024**, 97 (8).
- (9) Doustkhah, E.; Hassandoost, R.; Yousef Tizhoosh, N.; **Esmat, M.**; Guselnikova, O.; Hussein N. Assadi, M.; Khataee, A. Ultrasonically-Assisted Synthesis of CeO₂ within WS₂ Interlayers Forming Type II Heterojunction for a VOC Photocatalytic Oxidation. *Ultrason Sonochem* **2023**, 92, 106245.
- (10) El-Hosainy, H.; Mine, S.; Toyao, T.; Shimizu, K.; Tsunoji, N.; **Esmat, M.**; Doustkhah, E.; El-Kemary, M.; Ide, Y. Layered Silicate Stabilises Diiron to Mimic UV-Shielding TiO₂ Nanoparticle. *Mater Today Nano* **2022**, 19, 100227.
- (11) Doustkhah, E.; **Esmat, M.**; Fukata, N.; Ide, Y.; Hanaor, D. A. H.; Assadi, M. H. N. MOF-Derived Nanocrystalline ZnO with Controlled Orientation and Photocatalytic Activity. *Chemosphere* **2022**, 303, 134932.
- (12) Abdelhameed, M.; Abdelbar, M. F.; **Esmat, M.**; Jevasuwan, W.; Fukata, N. Hole-Injection Role of Solution-Processed Thermally Treated VO_x Thin Films in Si Nanowire-Based Solar Cells. *Nano Energy* **2022**, 99, 107373.
- (13) Iqbal, M. F.; Yang, Y.; Hassan, M. U.; Zhang, X.; Li, G.; Hui, K. N.; **Esmat, M.**; Zhang, M. Polyaniline Grafted Mesoporous Zinc Sulfide Nanoparticles for Hydrogen Evolution Reaction. *Int J Hydrogen Energy* **2022**, 47 (9).
- (14) Hassandoost, R.; Kotb, A.; Movafagh, Z.; **Esmat, M.**; Guegan, R.; Endo, S.; Jevasuwan, W.; Fukata, N.; Sugahara, Y.; Khataee, A.; Yamauchi, Y.; Ide, Y.; Doustkhah, E. Nanoarchitecturing Bimetallic Manganese Cobaltite Spinel for Sonocatalytic Degradation of Oxytetracycline. *Chemical Engineering Journal* **2022**, 431.

- (15) Doustkhah, E.; Assadi, M. H. N.; Komaguchi, K.; Tsunoji, N.; **Esmat, M.**; Fukata, N.; Tomita, O.; Abe, R.; Ohtani, B.; Ide, Y. In Situ Blue Titania via Band Shape Engineering for Exceptional Solar H₂ Production in Rutile TiO₂. *Appl Catal B* **2021**, 297.
- (16) Tahawy, R.; Doustkhah, E.; Abdel-Aal, E.-S. A.; **Esmat, M.**; Farghaly, F. E.; El-Hosainy, H.; Tsunoji, N.; El-Hosiny, F. I.; Yamauchi, Y.; Assadi, M. H. N.; Ide, Y. Exceptionally Stable Green Rust, a Mixed-Valent Iron-Layered Double Hydroxide, as an Efficient Solar Photocatalyst for H₂ Production from Ammonia Borane. *Appl Catal B* **2021**, 286.
- (17) El-Hosainy, H.; Tahawy, R.; **Esmat, M.**; El-Kemary, M.; Ide, Y. Immobilization of Iron Minerals on a Layered Silicate for Enhancing Its Solar Photocatalytic Activity toward H₂ Production. *Front Energy Res* **2021**, 9.
- (18) Abdelbar, M. F.; Abdelhameed, M.; **Esmat, M.**; El-Kemary, M.; Fukata, N. Energy Management in Hybrid Organic-Silicon Nanostructured Solar Cells by Downshifting Using CdZnS/ZnS and CdZnSe/ZnS Quantum Dots. *Nano Energy* **2021**, 89.
- (19) Torad, N. L.; El-Hosainy, H.; **Esmat, M.**; El-Kelany, K. E.; Tahawy, R.; Na, J.; Ide, Y.; Fukata, N.; Chaikittisilp, W.; Hill, J. P.; Zhang, X.; El-Kemary, M.; Yamauchi, Y. Phenyl-Modified Carbon Nitride Quantum Nanoflakes for Ultra-Highly Selective Sensing of Formic Acid: A Combined Experimental by QCM and Density Functional Theory Study. *ACS Appl Mater Interfaces* **2021**, 13 (41).
- (20) Abdelaal, H. M.; Shaikjee, A.; **Esmat, M.** High Performing Photocatalytic ZnO Hollow Sub-Micro-Spheres Fabricated by Microwave Induced Self-Assembly Approach. *Ceram Int* **2020**, 46 (12).
- (21) Doustkhah, E.; Najafi Zare, R.; Yamauchi, Y.; Taheri-Kafrani, A.; Mohtasham, H.; **Esmat, M.**; Ide, Y.; Fukata, N.; Rostamnia, S.; Sadeghi, M. H.; Assadi, M. H. N. Template-Oriented Synthesis of Hydroxyapatite Nanoplates for 3D Bone Printing. *J Mater Chem B* **2019**, 7 (45).
- (22) Zaki, A. H.; El-Shafey, A.; Moatmed, S. M.; Abdelhay, R. A.; Rashdan, E. F.; Saleh, R. M.; Abd-El Fatah, N.; Tawfik, M. M.; **Esmat, M.**; El-dek, S. I. Morphology Transformation from Titanate Nanotubes to TiO₂ Microspheres. *Mater Sci Semicond Process* **2018**, 75.
- (23) Ewais, E. M. M.; El-Amir, A. A. M.; Besisa, D. H. A.; **Esmat, M.**; El-Anadoul, B. E. H. Synthesis of Nanocrystalline MgO/MgAl₂O₄ Spinel Powders from Industrial Wastes. *J Alloys Compd* **2017**, 691.
- (24) Tawfik, W. Z.; **Esmat, M.**; El-Dek, S. I. Drastic Improvement in Magnetization of CdO Nanoparticles by Fe Doping. *Applied Nanoscience* **2017**, 7 (8).

AWARDS

Top PhD graduate:

The University of Tsukuba selected me to deliver the commencement speech on behalf of the graduation class 2022.

RESEARCH INTERESTS

Specializing in nanomaterials and nanotechnology with a focus on photocatalysis, environmental remediation, and solar energy conversion. Expertise in developing and characterizing 1D and 2D nanomaterials, and nanoparticles, for applications in solar hydrogen production and water purification. Experienced in materials science, catalytic processes, and band shape engineering.

EXPERIENCES

- Nanomaterial's preparation methods (e.g., Ultrasonic, Chemical vapor deposition (CVD) system, Microwave reactor, Hydrothermal reactor, Ball milling, and other chemical methods)
- Materials characterization techniques (i.e., XRD, FTIR, Raman, SEM, TEM, BET, ESR, PL, and UV-vis spectra)
- Gas chromatography

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- Low-dimensional TiO₂-based materials and their photocatalytic applications
 - Synthesis and modification of 2D materials (layered titanate)
 - Photocatalytic water splitting and photoreduction of metal ions
 - Water purification
 - Synthesis of different nanomaterials (i.e., mesoporous silica, carbon nitride nanosheets, titanate nanotubes, cobalt ferrite nanoparticles, graphene oxide (GO), and carbon nanotubes (CNTs))
 - Preparation of polyaniline nanofibers and nanotubes by simple chemical methods.

CONFERENCE ACTIVITY

Participated in the following conferences:

1. Barcelona-Grenoble-Tsukuba “Clustering and Global Challenges” (CGC2021), April 07-09, 2021, online (**Oral**)
2. MANA International Symposium 2021, March 02-03, 2021, NIMS, Japan, online (**Poster**)
3. 2nd International Symposium on Chemistry of Materials, March 28-29, 2019, NIMS, Japan (**Poster**)
4. 13th International Conference on Chemistry and Its Role in Development, March 20-24, 2017, Sharm El Sheikh, Egypt (**Poster**)
5. 3rd Edition Nanotech Dubai 2016 Conference and Exhibition (Nanotech Dubai 2016), Dec 05 - 07, 2016 - Dubai, United Arab Emirates (**Poster**)
6. The 1st International Conference of Environmental Security and Global Climate Change (ESGCC-1), April 10-12, 2016, PSAS, BSU, Egypt (**Attendance**).

Selected to be one of the organizing committees of:

1. 2nd international conference on Advanced, Basic and Applied Sciences (ABAS-II) 2014, Ain Sokhna, Egypt
2. The 3rd International Conference (ICAAS-III), Nov. 17-20, 2015, Hurghada, Egypt
3. The Fourth International Conference on Advanced Sciences (ICAS4), November 7-10, 2017, Hurghada, Egypt.
4. “**Nanobiotechnology training course**” held from 3rd to 5th March 2015 at PSAS, BSU, Egypt
5. “**Scientific writing**” workshop held on 28th March 2015 at PSAS, BSU, Egypt
6. 1st International workshop on “**Recent advances in nanomaterials**”, Nov. 21-22, 2015, PSAS, BSU, Egypt.

FUNDED PROJECTS

1. PI of the project entitled “Preparation and Characterization of Functionalized Polymer Nanostructures for Heavy Metals Removal from Polluted Water”, including short-term travel to NIMS, Japan, Funded by STDF, Egypt (2017).
2. A member in a project entitled “Synthesis of innovative hollow fibers polymer nanocomposite for selective removal of arsenic from drinking and groundwater” Funded by STDF, Egypt (2015).

JOURNAL REVIEW AND EDITORIAL SERVICE

- Reviewer**
- Applied Catalysis B: Environmental
 - Chemical Engineering Journal
 - ACS Applied Materials & Interfaces
 - ACS Applied Nano Materials
 - Arabian Journal of Chemistry
 - Energy Conversion and Management

TEACHING EXPERIENCE

- Courses**
- Applied physical chemistry.
 - Instrumental Analysis.
 - Synthesis and Characterization of Nanomaterials.
 - Nanomaterials for catalysis