

CURRICULUM VITAE

Dr. Monalisa Pal

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Department of Chemistry,
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Education:

Ph.D. in Chemistry from S.N. Bose National Centre for Basic Sciences, University of Calcutta in 2016.

M.Sc in Chemistry from IIT Delhi in 2012; with CGPA: 8.589.

B.Sc in Chemistry (honours) with Physics and Mathematics from Vivekananda College, University of Calcutta in 2010; with marks: 70% (1st class).

Higher Secondary (WBCHSE) in 2007, from Fatepur Shreenath Institution, with marks 80.5%.

Secondary (WBBSE) in 2005, from Sarisha Ramakrishna Mission Sarada Mandir, with marks 88.5%.(Rank 73)

Professional Career and Research Experience:

1. **Assistant Professor** (From November, 2020 to till date)

Department of Chemistry, Institute of Science, Banaras Hindu University (BHU), Varanasi, India.

2. **Postdoctoral Research** (From March, 2017 to November 2020)

Area of research: Fabrication of Wafer-Scale Flexible Electrodes and Devices through Synthesis of Carbon/Semiconducting Thin Films.

Advisor: Prof. Unyong Jeong, Department of Materials Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk, Republic of Korea.

3. **Postdoctoral Research** (From January, 2016 to January, 2017)

Area of research: Direct Immobilization of Antibodies on Zn-Doped Fe₃O₄ Nanoclusters for Detection of Pathogenic Bacteria.

Advisor: Prof. Sangmin Jeon, Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Gyeongbuk, Republic of Korea.

4. Ph.D. Research (From August, 2012 to December, 2015)

Thesis title: Surface Modification of Metal Oxides to Induce Multifunctionality at the Nanoscale.

Advisor: Prof. Kalyan Mandal, Department of Condensed Matter Physics and Material Sciences, S. N. Bose National Centre for Basic Sciences, JD Block, Sector III, Salt Lake City, Kolkata 700106

5. M.Sc Course Project (August, 2011- July, 2012)

Area of research: Synthesis of TiO₂/CuO nanocomposite and study of photocatalytic activity.

Advisor: Prof. Ashok Kumar Ganguli. Department of Chemistry, Indian Institute of Technology (IIT), Delhi, India.

6. Summer Project (May-July, 2011)

Area of research: Synthesis of different sizes of CdTe nanoparticles in aqueous medium and study their optical properties.

Advisor: Prof. Amitava Patra. Department of Material Science, Indian Association for the Cultivation of Science (IACS), Kolkata, India.

List of Publications: (Monalisa Pal= **M. Pal**)

1. "Pseudoequilibrium between Etching and Selective Grain Growth: Chemical Conversion of a Randomly Oriented Au Film into a (111)-Oriented Ultrathin Au Film "

G. Park, [†] A. Giri, [†] M. Kumar, S. Moon, **M. Pal**, D. Kim, and U. Jeong*

Nano Letters, 2021, <https://doi.org/10.1021/acs.nanolett.1c03712>. (I.F.= 11.18)

2. "Large-Area Epitaxial Film Growth of van der Waals Ferromagnetic Ternary Chalcogenide"

A. Giri*, C. De, M. Kumar, **M. Pal**, H. Lee, J. S. Kim, S.-W. Cheong, U. Jeong*

Advanced Materials 2021, 2103609, DOI: 10.1002/adma.202103609. (I.F.= 30.84)

3. “Surface Diffusion and Epitaxial Self-Planarization for Wafer-Scale Single Grain Metal Chalcogenide Thin Films”

A. Giri*, M. Kumar, J.Kim, **M. Pal**, W. Banerjee, R. D. Nikam, J. Kwak, M. Kong, S. H. Kim, K. Thiyagarajan, G. Kim, H. Hwang, H. H. Lee, D. Lee* U. Jeong*

Advanced Materials 2021, 33, 2102252. DOI: 10.1002/ adma.202102252 (**I.F.= 30.84**)

4. “Electroactive 1T-MoS₂ Fluoroelastomer Ink for Intrinsically Stretchable Solid-State In-Plane Supercapacitors”

K. Thiyagarajan, W.Song, H. Park, V. Selvaraj, S. Moon, J. Oh, M. Kwak, G. Park, M. Kong, **M. Pal**, J. Kwak, A. Giri, J.Jang, S. Park, U. Jeong

ACS Applied Materials & Interfaces, 2021, 13, 23, 26870–26878. (**I. F. 9.22**)

5. “Fabrication of Foldable Metal Interconnections by Hybridizing with Amorphous Carbon Ultrathin Anisotropic Conductive Film.”

M. Pal, A. Giri, D. Kim, S. Shin, M. Kong, K. Thiyagarajan, J. Kwak, O. Okello, S.Y. Choi and U. Jeong

ACS Nano, 2019,13 (6), 7175-7184. (**I.F. 15.88**)

6. “Highly Deformable Transparent Au Film Electrodes and Their Uses in Deformable Displays.”

D.W. Kim, G. Lee, **M. Pal**,* and U. Jeong*. **ACS Applied Materials & Interfaces** 2020, 12, 41969–41980. (**I.F. 9.22**)

7. “Synthesis of 2D Metal Chalcogenide Thin Films through the Process Involving Solution-Phase Deposition”

A Giri, G Park, H Yang, **M Pal**, J Kwak, U Jeong

Advanced Materials, 2018, 30, 1707577. (**I.F. 30.84**)

8. “[Synthesis of Atomically Thin Transition Metal Ditetelluride Films by Rapid Chemical Transformation in Solution Phase.](#)”

A. Giri, H. Yang, W. Jang, J. Kwak, K. Thiyagarajan, **M. Pal**, D. Lee, R. Singh, C. Kim, K. Cho, A. Soon, U Jeong

Chemistry of Materials, 2018, 30 (7), 2463. **(I.F. 9.81)**

9. “[Perovskite Solar Cell with an MoS₂ Electron Transport Layer](#)”

R. Singh, A. Giri, **M. Pal**, K. Thiyagarajan, J. Kwak, U. Jeong and K. Cho

Journal of Materials Chemistry A, 2019, 7, 7151. **(I.F. 12.7)**

10. “[High-performance transparent conductive pyrolyzed carbon \(Py-C\) ultrathin film](#)”

M. Pal, G. Lee, A. Giri, K. Thiyagarajan, K. Baek, M. Kumar, and U. Jeong

Journal of Materials Chemistry C, 2020, 8, 9243-9251. **(I.F. 7.393)**

11. “[Surface Modification of MnFe₂O₄ Nanoparticles to Impart Intrinsic Multiple Fluorescence and Novel Photocatalytic Properties](#)”

M. Pal,* R. Rakshit, and K. Mandal

ACS Applied Materials & Interfaces, 2014, 6, 4903. **(I.F. 9.22)**

12. “[Direct Immobilization of Antibodies on Zn-doped Fe₃O₄ Nanoclusters for Detection of Pathogenic Bacteria.](#)”

M. Pal, S. Lee, D. Kwon, J. Hwang, H Lee, S Hwang and S Jeon

Analytica Chimica Acta, 952 (2017) 81-87. **(I.F. 5.977)**

13. “[Ultra High Supercapacitance of Ultra Small Co₃O₄ Nanocubes.](#)”

M. Pal,* R. Rakshit , A. K. Singh, and K. Mandal

Energy, 2016,103,481-486. **(I.F. 6.082)**

14. “Facile functionalization of Fe₂O₃ nanoparticles to induce inherent photoluminescence and excellent photocatalytic activity”

M. Pal,* R. Rakshit, and K. Mandal

Applied Physics Letter, 2014, 104, 233110. **(I.F. 3.597)**

15. “Surface Chemistry Modulated Introduction of Multifunctionality within Co₃O₄ Nanocubes.”

M. Pal,* A. K. Singh, R. Rakshit, and K. Mandal

RSC Advances, 2015, 5 (21), 16311-16318. **(I.F. 3.119)**

16. “Ligand Induced Evolution of Intrinsic Fluorescence and Catalytic Activity from Cobalt Ferrite Nanoparticles.”

M. Pal,* A. Kundu, R. Rakshit, and K. Mandal

ChemPhysChem, 2015, 16 (8), 1627-1634. **(Cover Article) (I.F. 3.144)**

17. “Surface Modification of α -Fe₂O₃ Nanoparticles to Develop as Intrinsic Photoluminescent Probe and Unprecedented Photocatalyst.”

M. Pal,* R. Rakshit; M. Mandal, and K. Mandal

Magnetics, IEEE Transactions on, 2014, 50 (11), 1-4. **(I.F. 1.626)**

18. “Charge Transfer Mediated Magnetic Response of Cobalt Ferrite Nanoparticles.”

R. Rakshit, **M. Pal**, M. Mandal, and K. Mandal

Materials Letters, 2015, 151, 64-67. **(I.F. 3.204)**

19. “Tuning of Magnetic Properties of CoFe₂O₄ Nanoparticles through Charge Transfer Effect”

R. Rakshit, M. Mandal, **M. Pal**, and K. Mandal

Applied Physics Letter, 2014, 104, 092412. **(I.F. 3.597)**

20. “[Acoustic Vibration Induced High Electromagnetic Responses of Fe₃O₄ Nano-hollow Spheres in the THz Regime.](#)”

R. Rakshit, D. Sarkar, **M. Pal**, K. Serite, M. Tonouchi, and K. Mandal

Journal of Physics D: Applied Physics, 2015, 48, 245301. **(I.F. 3.169)**

21. “[Rational Surface Modification of Mn₃O₄ Nanoparticles to Induce Multiple Photoluminescence and Room Temperature Ferromagnetism.](#)”

A. Giri, N. Goswami, **M. Pal**, M. T. Zar Myint, S. Al-Harhi, A. Singha, B. Ghosh, J. Dutta, and S. K. Pal

Journal of Materials Chemistry C, 2013, 1 (9), 1885-1895. **(I.F. 7.393)**

22. “[Research Update: Facile Synthesis of CoFe₂O₄ Nano-hollow Spheres for Efficient Bilirubin Adsorption.](#)”

R. Rakshit, **M. Pal**, A. Chaudhuri, M. Mandal, and K. Mandal

APL Materials, 2015, 3, 11071. **(I.F. 3.819)**

23. “[Electrochemical Supercapacitor Based on Double Perovskite Y₂NiMnO₆ Nanowires.](#)”

M. Alam, K. Karmakar, **M. Pal**, and K. Mandal

RSC Advances, 2016, 6, 114722–114726. **(I.F. 3.119)**

24. “[Influence of Functional Group of Dye on the Adsorption Behaviour of CoFe₂O₄ Nano-hollow Spheres.](#)”

R. Rakshit, E. Khatun, **M. Pal**, S. Talukdar, D. Mandal, P. Saha, and K. Mandal

New Journal of Chemistry, 2017, 41, 9095-9102. **(I.F. 3.288)**

25. “[Terahertz Conductivity Study of Magnetite Nanostructures](#)”

R. Rakshit, **M. Pal**, and K. Mandal

AIP Conference Proceedings, 2015, 1665, 050007.

26. “[Evaluation of SiO₂@CoFe₂O₄ Nano-hollow Spheres through THz Pulses.](#)”

R. Rakshit, **M. Pal**, K. Serita, A. Chaudhuri, M. Tonouchi, and K. Mandal

AIP Conference Proceedings, 2016, 1728, 020084.

Patents:

1. [Method of Preparing Ultra-thin Amorphous Carbon Film Using Solution Phase](#)

M. Pal and U. Jeong

Application KR 1020200129752, Dated 2020.11.18.

2. [Foldable Hybrid Circuit Comprising Anisotropic Conductive Carbon Film and Method of Preparing the Same](#)

M. Pal and U. Jeong

Application KR 1020200129754, Dated 2020.11.18.

Awards and Distinctions:

- **Silver best poster award** from **IEEE Magnetics Society**, USA (2015).
- **DST SERB travel award, Korea.** (2015)
- **National Merit Scholarship, rank 73** in WBBSE (2005).
- **B.Sc. 1st class 2nd rank** in Vivekananda college, CU. (2010).
- **GATE** (2012), All India rank **180**.
- **CSIR-UGC NET** 2012.
- **IIT JAM** (2010), All India rank **112**.

Research Skill:

Post-doctoral Experiments:

Experimental nano electronics

1. Synthesis of wafer scale, precise thickness controllable, transparent and deformable carbon, graphitic, and metal thin film by solution phase route,
2. Micropatterning by photolithography,
3. Fabrication of foldable metal circuits, electrodes for perovskite light-emitting diode (PeLED) and biaxially-stretchable alternating current electroluminescence (ACEL) display,
5. Synthesis of MoTe₂ thin film and fabrication of photodetector.
6. Synthesis of MoS₂ thin film over FTO and its use as electron transport layer for perovskite solar cell.
7. Facile synthesis of single crystal, wafer scale metal tellurides for transfer-free fabrication of switching devices.

(ACS Nano, 2019,13 (6), 7175-7184.) (Journal of Materials Chemistry C, 2020., 2020) (Advanced Materials, 2018, 30, 1707577.) (Chemistry of Materials, 2018, 30 (7), 2463.) (Journal of Materials Chemistry A, 2019, 7, 7151.)

Bio-sensing

1. Synthesis of uniform Zn-Doped Fe₃O₄ nanoclusters.
2. Immobilization of antibodies on nanoparticles or any substrates.
3. Detection of pathogenic bacteria from food.
4. Biosensing and selectivity test. (Analytica Chimica Acta, 952 (2017) 81-87.)

Ph.D. Experiments:

Surface engineering of nanomaterials

1. Synthesis of nanostructures (MnFe₂O₄, CoFe₂O₄, Fe₂O₃, Mn₃O₄ nanoparticles, Co₃O₄ nanocubes, Fe₃O₄, MnFe₂O₄, CoFe₂O₄ nano hollow spheres, Y₂NiMnO₆ Nanowires) by wet chemical routes such as reflux, solvothermal and electrodeposition route. Template assisted electrodeposition technique for fabrication of high density ordered arrays of 1D polycrystalline nanowire and nanotube of transition metals and their corresponding oxides.

2. Rational surface engineering for phase transfer, modulation of magnetism, development of multiple fluorescence.
3. Investigation of mechanism of multiple fluorescence by time resolved ultrafast spectroscopic studies.
4. Removal of model pollutant and toxic biomolecules from water by catalysis or adsorption.
5. Terahertz conductivity study of nanostructures.
6. Electrode fabrication and study of supercapacitance property of nanostructures using three electrodes based electrochemical cell equipped with linear sweep voltammetry, charging-discharging, and electrochemical impedance spectroscopy facilities.

(**ACS Applied Materials & Interfaces**, 2014, 6, 4903.)(**ChemPhysChem**, 2015, 16 (8), 1627-1634)

(**Applied Physics Letter**, 2014, 104, 233110.)(**RSC Advances**, 2015, 5 (21), 16311-16318) (**Energy**, 2016,103,481-486.)

Pre-Ph.D. Experiments:

1. Aqueous phase synthesis of CdTe quantum dots of different size and study their optical properties.
2. Solvothermal synthesis of TiO₂/CuO nanocomposite and study of photocatalytic activity.

Conferences Attended:

1. **Oral** presentation on “Surface Modification of Manganese-ferrite Nanoparticles to Develop Magnetofluorescent Imaging Probe and Efficient Photocatalyst” at the 3rd International Conference on Advanced Nanomaterials and Nanotechnology, (ICANN 2013) held from December 1-3 at IIT Guwahati, India.
2. **Oral** presentation on “Surface Modification of Manganese-ferrite Nanoparticles to Impart Novel Optical and Catalytic Properties” at the International Union of Materials Research Societies – International Conference in Asia – 2013 (IUMRS-ICA-2013), held during December 16-20, 2013 at IISC Bangalore, India.
3. Presented a **poster** at the International Conference on Nano Science and Technology (ICONSAT-2014), held from March 2-5, 2014, in Mohali, India.
4. Presented a **poster** at the DAE-BRNS National Conference on Current Trends in Advanced Materials (CTMat-2014) held from November 19 – 21, 2014, at VECC, Kolkata, India.
5. Presented a **poster** at NANODAYS-2015, held from February 16-18, 2015, at SNBNCBS, Kolkata, India.

6. Presented a **poster** at 8th IEEE Magnetics Society Summer School, held from June 14-19, 2015, in the University of Minnesota, Minneapolis, USA.
7. **Oral** presentation at Young Scientists' Colloquium-2015 (YSC-2015), Materials Research Society of India (MRSI), Kolkata Chapter, held on September 11, 2015, at CSIR-Central Glass and Ceramic Research Institute, Kolkata, India.
8. **Oral** presentation at the 14th International Union Materials Research Societies-International Conference on Advanced Materials (IUMRS-ICAM-2015), held on October 25-29, 2015, at Jeju International Convention Center, Jeju, South Korea.
9. Presented a **poster** at NANO KOREA-2018, held from July 10-13, 2018, at KINTEX, Goyang-Si, South Korea.
10. **Oral** presentation at the The 6th International Conference on Electronic Materials and Nanotechnology for Green Environment, held from November 1-4, 2020, at Ramada Plaza Hotel, Jeju, South Korea.

Personal Details:

Date of birth- 06/09/1989

Gender- Female

Nationality- Indian

Languages known- English, Bengali, Hindi

Permanent address- Village-Hayatnagar, P.O- Shirakole, District- South 24 parganas, P.S-Usthi, West Bengal, India, Pin code-743513.