MOHAMMAD ABDULLAH AL MAMUN

CONTACT INFORMATION

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RESEARCH INTERESTS

Light matter interaction at nanoscale, Novel topological states of matter, Two – dimensional materials, Synthesis & fabrication techniques, First – principle Calculations of Novel Materials.

EDUCATION

Bangladesh University of Engineering & Technology (BUET)

- M.Sc. in Glass & Ceramic Engineering October, 2019
  CGPA: 3.5/4.0 | *Supervisor:* Prof. Md. Fakhrul Islam
  Thesis: "Role of Oxygen Vacancies on Ferromagnetism in Oxide based Dilute Magnetic Semiconductor"
- B.Sc. in Materials & Metallurgical Engineering February, 2017
  CGPA: 3.54/4.0 (Last 4 semesters CGPA: 3.71/4.00)
  Thesis: "Hydrothermal Synthesis & Characterization of Pure & Doped $BiVO_4$ NPs"

RESEARCH EXPERIENCES

Dilute Magnetic Oxides for Multifunctional Applications

PIs: Prof. Md. Fakhrul Islam & Dr. Md. Abdullah Zubair

- $Ti_{1-x}M_xO_2$ & $Ce_{1-x}M_xO_2$ nanoparticles (NPs) have been synthesized using sol – gel and hydrothermal chemical routes.
- Effect of heat treatment and doping of Transition and Rare Earth Metal ions on oxygen vacancy concentration in $Ti_{1-x}M_xO_2$ & $Ce_{1-x}M_xO_2$ have been investigated.
- Structural properties were investigated using XRD, Raman, HR – TEM and XPS analysis. Optical and Magnetic properties were investigated using UV – Vis and VSM analysis respectively.
- To investigate the photocatalytic activities, a photo – reactor has been designed which is equipped with UV and Visible light sources and cooling systems.

Multifunctional Materials for Photocatalytic and Antibacterial Applications

PIs: Prof. Md. Abdul Matin & Prof. M. A. Hakim

- $BiV_{1-x}M_xO_4$ & $CeO_2 - CePO_4$ NPs have been synthesized using hydrothermal and green synthesis routes (using leaf extracts) respectively.
- The antibacterial activities of the NPs have been investigated against two gram positive (*S. aureus and B. cereus*) and two gram negative bacteria (*E. coli and S. typhimurium*) following disc diffusion assay.
- The cytotoxicity effect of $CeO_2 - CePO_4$ NPs were observed on two mammalian cell lines (HeLa and Vero).
- Effect of Transition Metal ion doping in $BiV_{1-x}M_xO_4$ NPs are currently investigated

JOURNAL PUBLICATIONS

1. **Md. Abdullah Al Mamun***, Manifa Noor*, A.K.M Atique Ullah, Md. Sarowar Hossain, Matin Md. Abdul, Md. Fakhrul Islam, M.A Hakim. *"Effect of $CePO_4$ on Structural, Magnetic and Optical Properties of Ceria Nanoparticles"* Materials Research Express (2018). (* for equal contribution of authors). [PDF]
2. **Md. Abdullah Al Mamun**, Manifa Noor, Muhammad Hasanuzzaman, Saleem Hashmi. *"Nano-Porous Materials for Use in Solar Cells and Fuel Cells"* Reference Module in Materials Science and Materials Engineering, Elsevier. (2019) [PDF]
3. Sapan Kumar Sen, Manifa Noor, **Md. Abdullah Al Mamun**, M. S. Manir, M. A. Matin, M. A. Hakim, Salahuddin Nur, Supria Dutta. *"An investigation of ^{60}Co gamma radiation-induced effects on the properties of nanostructured α-MoO_3 for the application in optoelectronic and photonic devices"*. Optical and Quantum Electronics, Springer (2019) [PDF]

JOURNALS UNDER REVIEW

– Manifa Noor*, **Md. Abdullah Al Mamun***, M.A. Hakim, A.K.M Atique Ullah, Md. Fakhrul Islam, Md. Abdul Matin "Enhanced Antibacterial Efficacy and In vitro Cytotoxicity of Green Synthesized CeO_2 Nanoparticles" (* for equal contribution of authors)

JOURNALS IN PREPARATION

- **Md. Abdullah Al Mamun**, Manifa Noor, Karrina McNamara, Md. Sarowar Hossain, SAM Tofail, Abdullah Zubair, Md. Fakhrul Islam, "Dilute Magnetic Oxides for Multifunctional Applications"
- Manifa Noor, **Md. Abdullah Al Mamun**, M. A. Hakim, Md. Fakhrul Islam, M. A. Basith, Md. Abdul Matin, "Enhanced Photocatalytic Dye Degradation and Water Splitting by Visible Light Driven Photocatalyst Mn: $BiVO_4$"

PEER – REVIEWED CONFERENCES

- Matin, M.A., Noor, M., **Mamun, M.A.A.**, Hakim, M.A., Islam, M.F., Khanom, F., Rafique Ahmed, A.K.M. & Ramakrishna, S. "Green nanotechnology for effective dye-degradation of industrial effluents" Conference by Circular Economy Asia Pacific, 2019. NUS, Singapore.
- Manifa Noor, **Md Abdullah Al Mamun**, M.A. Matin, Md. Fakhrul Islam, Saima Haque, Farabi Rahman, Nazmul Hossaim and M A Hakim "Effect of pH Variation on Structural, Optical and Shape Morphology of $BiVO_4$ Photocatalysts" 10th Int. Conference on Electrical & Computer Engineering (ICECE) 2018. Dhaka, Bangladesh.
- Manifa Noor, **Md. Abdullah Al Mamun**, A.K.M. Atique Ullah, M.A. Matin, Saima Haque, Fakhrul Islam, M.A. Hakim "Green Synthesis of CeO_2 Nanoparticles Using Arthocarpous heterohylus Leaf Extract for Photocatalytic Activity" 2nd Int. Conference on Physics for Sustainable Development and Technology (ICPSDT), 2017. Chittagong, Bangladesh. (Won the "Best in Session" award).
- **Md. Abdullah Al Mamun**, A.F.M. Hossain, Mehedi Hasan, Md. Miftaur Rahman "Hydrothermal Synthesis & Characterization of Bismuth Vanadate Photocatalyst" Proc. International Conf. of Engineering Materials & Metallurgical Engineering (ICEMME) 2016. Dhaka, Bangladesh.

AWARDS AND SCHOLARSHIPS

- Dean's List, Faculty of Engineering, BUET, 2016.
- University Merit Scholarship, Faculty of Engineering, BUET, 2015 – 2016.
- 9th at ACM – ICPC Semifinal, Bangladesh Site, (BUET_Seivers), 2014.
- Honorable Mention, Inter University Programming Contest at Daffodil University, Bangladesh, 2014.
- 6th BUET Intra Programming Contest (BUET_Seivers), BUET, Bangladesh, 2013.

TEACHING EXPERIENCE

Teaching Assistant, Dept. of GCE, BUET

- GCE 6602: Nanoceramics (October Semester, 2017)
- GCE 6402: Magnetic Ceramics (October Semester, 2018)

PROFESSIONAL EXPERIENCE

Research Associate, Dept. of GCE, BUET November 2018 – Present

- Performed several Industrial and one government research investigation.
- My responsibility is to assist and mentor other M.Sc. and B.Sc. students with their materials synthesis and characterization analysis.

PROGRAMMING EXPERIENCE

- Wrote C++ codes to analyze the randomly post processed data found from LAMMPS. [Link]
- Wrote an Algorithm in C++ for "Industrial Design Layout & Manufacturing Cost Estimation of Cast Iron Pot" (Senior Year Project) [Link]
- Participated & won titles in several national & international programming contests arranged in Bangladesh as an algorithmic contestant of BUET Programming Teams, 2012 – 2014.

TECHNICAL SKILLS

- Hands on experience on operating XRD (Empyrean, PANalytical), UV – Vis Spectroscopy (LAMBDA 1050, Perkin-Elmer, USA), FE – SEM (JSM 7600F, JEOL, Japan), Spin Coater, Microwave Reactor, High Temperature Furnace, Photocatalytic Reactor.
- Programming Languages: C, C++
- Scientific Computing Environment: MATLAB, Origin Plot.
- Visualizing Tools: ImageJ, Vesta, Ovito.
- Rietveld Refinement: Highscore Plus, Fullprof Suite.

RFERENCES

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