# Curriculum Vitae

## Personal information:

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| **Name** | **: Md. Abdul Mannan** |
| Date of Birth | : January 6, 1975 |
| Place of Birth | : Naogaon, Bangladesh |
| Nationality | : Bangladeshi |
| Degree | : PhD in the field of advanced carbon based materials, Saga University, Japan |
| Mailing address | : Department of Chemistry, University of Rajshahi, Bangladesh |
| Cell phone | : +8801753841119 |
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| E-mail | : mannan.chem@ru.ac.bd, amannan75@yahoo.com |
| Marital status | : Married (Father of Two daughters and one son) |
| Current Job status | : Professor of Chemistry, University of Rajshahi, Bangladesh |

**Permanent Address:** Village: Chalkrajapur, Post: Gotgari, Thana: Manda-6510, District: Naogaon, Bangladesh

## Education:

(1). Ph.D. in the field of Energy and Materials Science (September, 2010) from Saga University, Japan (obtained)

(2). M. Eng. in the field of Chemistry and Applied Chemistry (September, 2007) from Saga University, Japan (Grade A)

(3). M.Sc. in the field of Organic Chemistry (1998) from Rajshahi University, Bangladesh (First class, in 3$^{rd}$ position in the merit list)

(4). B.Sc. (Honors) in the field of Chemistry (1996) from Rajshahi University, Bangladesh (First class, in 6$^{th}$ position in the merit list)

(5). Higher Secondary School Certificate (HSC) (1992) from Rajshahi Board, Bangladesh (First division)

(6). Secondary School Certificate (SSC) (1990) from Rajshahi Board, Bangladesh (First division).

## Job History:

(1). **Syndicate Member**, Sunamgang University of Science and Technology, Sungamgang, Sylhet (2025 - 2027).

(2). Professor, Department of Chemistry, Rajshahi University (20.10.2021 to date) (**Grade-2**).

(3). Associate Professor, Department of Chemistry, Rajshahi University (29.03.2016–19.10.2021)

(4). Assistant Professor, Department of Chemistry, Rajshahi University (28.09.2011–28.03.2016)

(5). Lecturer, Department of Chemistry, Rajshahi University (28.09.2004–27.09.2011)

(6). Chemist, Dhaka Community Hospital, Dhaka, Bangladesh (2000–2004)

## Teaching Experience:

1. 2004 to Till date**:** Taught B.Sc. (Hons) and M.Sc in the different courses of Chemistry.

## Research Interests:

1. **Functionalization of Hexagonal Boron Nitride (h-BN) Nanoparticles:** Development of metal and non-metal nanoparticle-functionalized h-BN via solvo/hydrothermal methods. Comprehensive multifunctional characterization using advanced instrumental techniques, with a focus on exploring potential biomedical applications.
2. **Synthesis and Characterization of Iron Nanoparticles:** Preparation of Fe nanoparticles through both chemical and green synthesis approaches, followed by detailed physicochemical characterization to evaluate their properties.
3. **Biomass-Derived Silicon Nanoparticles:** Fabrication of silicon nanoparticles from biomass sources using high-temperature thermal treatment, accompanied by thorough material characterization.
4. **Graphene Oxide (GO) and Reduced Graphene Oxide (r-GO):** Synthesis of GO and r-GO via the Hummers method, functionalization with various small organic molecules, and investigation of their applications in biomedical fields and optoelectronic devices.
5. **Isolation and Characterization of Bioactive Plant Molecules:** Extraction of natural bioactive compounds from plants and their structural elucidation using advanced spectroscopic techniques.

## Research Experience:

***(1). 2010-till to date:***

**Synthesis and Characterization of Functionalized Nanoparticles:** Development of Ag, Fe, and Si-functionalized hexagonal boron nitride (h-BN) nanoparticles using advanced synthetic approaches. Comprehensive characterization utilizing cutting-edge instrumental techniques such as X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy, and near-edge X-ray absorption fine structure (NEXAFS) spectroscopy with synchrotron radiation. Complementary morphological and elemental analyses performed using field emission scanning electron microscopy (FE-SEM), transmission electron microscopy (TEM), and energy-dispersive X-ray spectroscopy (EDX).

**Graphene Oxide Functionalization:** Synthesis of graphene oxide (GO) followed by functionalization with small organic molecules through a facile hydrothermal treatment method to tailor material properties for diverse applications.

**Phytochemical Extraction and Bioactive Compound Isolation:** Isolation and extraction of bioactive molecules from medicinal plants, aimed at exploring their therapeutic potential and chemical profiles.

**Phytochemical Screening and Antioxidant Activity Characterization:** Detailed phytochemical analysis and antioxidant assays employing sophisticated spectroscopic methods including proton ($^{1}H$) and carbon ($^{13}C$) nuclear magnetic resonance (NMR), gas chromatography-mass spectrometry (GC-MS), ultraviolet-visible (UV-Vis) spectroscopy, and Fourier-transform infrared (FT-IR) spectroscopy.

**Environmental Speciation and Remediation of Hazardous Metals:** Investigation of the speciation of toxic metals in environmental matrices and development of strategies for their effective remediation.

**Coordination Chemistry and Bioactivity of Metal Complexes:** Synthesis, structural characterization, and biological evaluation of mixed-ligand coordination complexes involving transition metals such as Ni(II), Cu(II), Zn(II), Cd(II), and Co(II). Characterization carried out through various spectroscopic techniques to elucidate structure-activity relationships.

***(2). Post-Doctoral research fellow (Kumamoto University, Japan): January to March, 2017:***

Conducted research at the Department of Applied Chemistry and Biochemistry, Faculty of Science and Technology, Kumamoto University, Japan, immediately following the completion of doctoral studies. The research focused on the synthesis and functionalization of graphene oxide and advanced carbon materials, targeting applications in glucose adsorption as well as oxygen and $CO_2$ reduction.

***(3). PhD fellow (Saga University, Japan): 2007 to 2010***

The PhD thesis, titled **"Synthesis and Structural Analysis of B–C–N Hybrid Films and Related Low-Dimensional Materials,"** was completed at Saga University, Japan, within the Department of Chemistry and Applied Chemistry, Division of Energy and Material Science.

My research focused on developing novel synthesis techniques for BCN nanomaterials using microwave and radiofrequency plasma-accelerated chemical vapor deposition methods. Additionally, I successfully fabricated one-dimensional silicon polymer thin films employing a high-vacuum electron bombardment technique.

For in-situ preparation and characterization, I utilized the ultra-high vacuum (UHV) chamber (~$1.7 \times 10^{-7}$ Pa) at the KEK Photon Factory's beamline BL-27A. Structural properties were investigated using synchrotron radiation at KEK in Tsukuba, Japan. Specifically, X-ray photoelectron spectroscopy (XPS) measurements were conducted with a 2.2 keV excitation source, while near-edge X-ray absorption fine structure (NEXAFS) spectra were acquired at photon energies ranging from 70 to 1900 eV at beamlines 27A and 11A, respectively. NEXAFS spectra were recorded in total electron yield mode using 300 l/mm laminar gratings by monitoring the sample current.

### *(4). M.Eng. (Thesis, Saga University, Japan): 2005 to 2007*

I completed a research project titled **"Preparation and Characterization of B–C–N Thin Films by Radio Frequency Plasma Enhanced Chemical Vapor Deposition"** as part of the requirements for the Master of Engineering degree in the Department of Chemistry and Applied Chemistry at Saga University, Japan. The structural properties of the synthesized materials were analyzed using X-ray photoelectron spectroscopy (XPS), field emission scanning electron microscopy (FE-SEM), and X-ray diffraction (XRD). XRD measurements were performed using Cu Kα radiation at 30 kV and 20 mA, while XPS analysis employed Al Kα or Mg Kα radiation sources.

### *(5). Research Chemist: 2000 to 2004*

In collaboration with Harvard Medical School, Harvard School of Public Health, and Dhaka Community Hospital in Bangladesh, I conducted a research project titled **"A Case-Control Study of Skin Cancer and Arsenic Exposure"** focusing on the epidemiology of arsenic exposure. This study involved a case-control analysis of Bangladeshi individuals exposed to arsenic and the incidence of bladder cancer.

I have extensive expertise in using Atomic Absorption Spectroscopy (AAS) to quantify arsenic levels in various matrices, including soil, plants, contaminated groundwater, as well as biological samples such as toenails, hair, and skin from exposed individuals. Additionally, I am proficient in applying AAS to assess toxic trace elements including lead (Pb), cadmium (Cd), chromium (Cr), zinc (Zn), and manganese (Mn) etc. in water samples to support water quality management efforts.

### *(6). M.Sc. (Organic Thesis, Rajshahi University): 1998 to 2000*

As part of my M.Sc. research in Chemistry at Rajshahi University, Bangladesh, I conducted a study titled **"Evaluation of Sand-Charcoal Filter Bed for Reduction of Arsenic Concentration from Arsenic-Polluted Water."** I developed a simple sand-charcoal filter bed

designed to effectively remove arsenic from contaminated groundwater and improve water quality. The arsenic levels were analyzed using UV-Vis spectroscopy.

I possess proficiency in the following instrumental techniques:

1. Microwave and Radiofrequency Plasma Enhanced Chemical Vapor Deposition (PECVD)
2. Direct Sputtering
3. X-ray Photoelectron Spectroscopy (XPS)
4. Near-Edge X-ray Absorption Fine Structure Spectroscopy (NEXAFS)
5. X-ray Diffraction (XRD)
6. Field Emission Scanning Electron Microscopy (FE-SEM)
7. Transmission Electron Microscopy (TEM)
8. Fourier Transform Infrared Spectroscopy (FT-IR)
9. Atomic Absorption Spectrophotometry (AAS)

## Total List of Publications:

1. **Md. Abdul Mannan**, Mirza Humaun Kabir Rubel, Shofiur Rahman, Md. Faruk Hossain, Md. Abdur Rahman, Shourav Paul, Tanvir Khan, Md. Abdul Matin, Syed Rashel Kabir, Md. Nizam Uddin, Tetsuya Kida. Hydrothermal Synthesis of $Fe_3O_4$-Functionalized Magnetic Hexagonal Boron Nitride (h-BN) Heterostructure for Ultrafast Visible-Light Photocatalysis, Selective Antibacterial and Anticancer Effects on MCF-7 Breast Cancer and HEK293T Normal Cell Lines. (Revised manuscript submitted: Journal of Alloys and Compounds).

2. M.M. Ali; N.N. Tamim; M. Shoeb; M.H. Hasan; M.H.K. Rubel; **M.A. Mannan**; M.S. Islam; M.A. Islam; A. Kumar; A. Mohammad; A.A. Aly; R. Haldhar, M. Khalid Hossain. Influence of Lead Content on the Structure and Properties of Melt-Quenched Lead Borosilicate Glasses. Journal of Physics and Chemistry of Solids, (In press).

3. D. D. Mazumder; N. R. Raheb; M. H. K. Rubel; **M. A. Mannan**; M. B. Uddin; Tanzid Hasan; A. Mohammad; A.A. Aly; R. Haldhar; M. K. Hossai. "First-Principles Investigation of Mechanical, Electronic, Thermophysical, and Optical Properties of Aluminate Sodalites Al6X4TeO12 (X = Ca, Cd) for Optoelectronic and Thermal Applications" Journal of Physics and Chemistry of Solids, (In press).

4. Md Abul Kalam Azad, Wongsakorn Phongsopitanun, Zin Zin Ei, Preedakorn Chunhacha, Mirza Humaun Kabir Rubel, **Md. Abdul Mannan**. Antimicrobial and anticancer activities of *Streptomyces* sp. HP41 isolated from the bark of *Albizia Saman* in Bangkok, Thailand (Under peer review: RSC Advances).

5. Md Borhan Uddin, Mirza Humaun Kabir Rubel, Soukaina Bouhmaidi, Arpon Chakraborty, M. Khalid Hossain, Shakeel Ahmad, Md Najmus Sakib, Mohammad Abdur Rashid, Larbi Setti, Shamsad Sharmin, SH Naqib, **Md. Abdul Mannan**. Thallium-Based Iodo-

Perovskites $TlMI_3$ (M = Ca, Sr) for Optoelectronic and Thermoelectric Applications: A DFT Investigation. Journal of Physics and Chemistry of Solids, (In press).

6. Toshar Hossain, Farhana Jahan, Md. Sabbir Hasan, Mahci Al Bashera, Ashrafun Nahar, Md. Kudrat-E-Zahan, **Md. Abdul Mannan**. A comprehensive evaluation of *Neolamarckia cadamba* leaves: Nutritional, elemental, and polyphenolic profiles with antioxidant properties. Applied Food Research 6 (2026) 101836, https://doi.org/10.1016/j.afres.2026.101836 (**Q1, IF=6.2**).

7. **Md. Abdul Mannan**, Mirza H. K. Rubel, Ashrafun Nahar, Toshar Hossain, Md. Abu Shamim Khan, Md. Rafiqul Islam, Md. Kudrat-E-Zahan: Evaluation of the physico-chemical ground water quality at Rajshahi University campus in Bangladesh, Journal of the Bangladesh Chemical Society 2023-24, 35(1&2), 73–84. (**Q0, IF=0**).

8. **Md. Abdul Mannan**, Mirza H. K. Rubel, Md. Abu Shamim Khan, Md Borhan Uddin, Md. Najmus Sakib, Md. Kudrat-E-Zahan: Determination of macro and micro nutrients in some selected herbal plants of Bangladesh by graphite-furnace atomic absorption spectrophotometry, Journal of the Bangladesh Chemical Society 2023-24, 35(1&2), 46–55. (**Q0, IF=0**).

9. **Md. Abdul Mannan**, Mirza Humaun Kabir Rubel, Md. Abdur Rahman, Anwar Ul Hamid, Md Borhan Uddin, Shota Kitamura, Manami Shimoyoshi, Taiga Kodama, Kousuke Sonda, Hiroki Douyama, Yu Nagata, Keigo Masumoto, Tetsuya Kida. Solvothermal synthesis, crystal structure, multifunctioning characterizations and anti-microbial activity assessment of Ag doped h-BN through silver diethyldithiocarbamate. Journal of Alloys and Compounds 1002 (2024) 175139. https://doi.org/10.1016/j.jallcom.2024.175139 (**Q1, IF=6.3**).

10. M.S. Hossain, N.A. Bitu, M.N. Khan, Ali Asraf, Faruk Hossen, **M.A. Mannan**, Kudrat-E-Zahan. 2,3-Dimethoxybenzaldehyde schiff base of sbdtc and its metal complexes of Ni(II), Cu(II), Zn(II) AND Cd(II): synthesis, characterization and biological activity. New Materials, Compounds and Applications, Vol.5, No.3, 2021, pp.182-191. (**Q4, IF=0.194**).

11. **Md. Abdul Mannan**, Liton Chandra, A.B.M. Nazmul Islam, Md. Saddam Hossain, Md. Kudrat-E-Zahan, Tetsuya Kida. *Averrhoa bilimbi*: A prospective source of bioactive compounds against antimicrobial and cytotoxic activity. Asian Journal of Chemistry. Vol. 32, No. 9 (2020), 2279-2283. https://doi.org/10.14233/ajchem.2021.22933, (**Q4, IF=0.16**).

12. Liton Chandra, A.B.M. Nazmul Islam, Nasiruddin, Amina Khatun, Md. Matiar Rahman, Md. Kudrat-E-Zahan, **Md. Abdul Mannan**. Quantitative evaluation of macro and micronutrients in *Averrhoa bilimbi*, *Mimusops elengi* and *Carissa carandas* fruits of Bangladesh. Asian Journal of Chemistry 32(9), (2020): 2279-2283. https://doi.org/10.14233/ajchem.2020.22788, (**Q4, IF=0.16**).

13. Susmita Saha, Md. Al-Amin Sarker, **Md. Abdul Mannan**. Effects of dietary calcium level on growth performance and mineral contents in *Labeo bata* (Hamilton, 1822). International Journal of Fisheries and Aquatic Studies. 8(4), (2020):96-102. (**Q0, IF=0**).

14. Raisul Islam, Ekhlass Uddin, Ashrafuzzaman, Nur Amin Bitu, Ali Asraf, Faruk Hossen, M. Haque, **Abdul Mannan**, Kudrat-E-Zahan. Recent Advances in Biological and Catalytic Activities of Schiff base containing Acetylacetone and their Metal Complexes - A Short Overview. Asian J. Research Chem. 13(5): September – October (2020). (**Q0, IF=0**).

15. Hoore Jannat, Md. Nasiruddin, Md. Saidul Islam, Md. Nazrul Islam, **Md. Abdul Mannan**, Md. Kudrat-E-Zahan. Determination of different Physico-chemical Parameters of ground and surface water of Rajshahi and Dinajpur District of Bangladesh. Asian Journal of Research in Chemistry. (2020); 13(3): 163-168. DOI:10.5958/0974-4150.2020.00032.2 (**Q4, IF=0.617**).

16. Md Saddam Hossain, **Md Abdul Mannan**, Md Kudrat-E-Zahan. Recent advances on microbial activity of metal complexes: A short review. International Journal of Chemistry Studies, 4(1), (2020): 17-24. (**Q0, IF=0**).

17. **Md. Abdul Mannan**, Yudai Hirano, Armando T. Quitain, M. Koinuma, Tetsuya Kida. Nitrogen, Sulfur Co-doped Reduced Graphene Oxide: Synthesis and Characterization. Micro and Nanosystems. 12(2), (2020) 129-134. DOI: 10.2174/1876402911666190722111138, (**Q4, IF=0.14**).

18. Md. Saddam Hossain, Md. Nur Amin Bitu, Md. Mahasin Ali, Md. Faruk Hossen, Md. Ali Asraf, **Md. Abdul Mannan**, Md. Kudrat-E-Zahan. Potential microbial applications of metal complexes containing amino acid derived schiff base ligands: an overview, Asian Journal of Microbiology and Biotechnology, 4(3), 135-148 (2019). (**Q4, IF=0.128**).

19. **Md. Abdul Mannan**, Nasiruddin, Md. Saddam Hossain, Nurun Nahar Nipa, Amina Khatun, Md. Ruhul Amin, Mukul Kumar Sarkar, Md. Kudrat-E-Zahan. Macro and micro nutrients in *Holy basil* (Tulsi): A possible supplement for natural medicine. International Journal of Chemistry Studies, Volume 3; Issue 4; July 2019; Page No. 43-47. (**Q0, IF=0**).

20. Kismat Ara Elachi, Md. Saddam Hossain, Md. Nur Amin Bitu, A.A.S.M.Zahid, Ranjan K Mohapatra, **Md. Abdul Mannan**, C.M.Zakaria, Md. Kudrat-E-Zahan. Synthesis, Spectral and Thermal Characterization on Bioactive Complexes of Mg(II), Zn(II), Sn(II), VO(II) and Bi(III) Ions Containing Schiff Base Ligand. Journal of Chemical, Biological and Physical Sciences. Sec. A; August 2019 – October 2019, Vol. 9, No. 4; 201-218. DOI:10.24214/jcbps.A.9.4.20118. (**Q0, IF=3.632**).

21. Md. Al-Amin Sarker, Yutaka Haga, **Md. Abdul Mannan**, Goro Yoshizaki, Shuichi Satoh. The effect of total replacement of fish oil with linseed oil on the growth performance and tissue fatty acid profile of red sea bream *Pagrus major*. (Manuscript submitted for publication).

22. **Md. Abdul Mannan**, Yudai Hirano, Armando T. Quitain, M. Koinuma, Tetsuya Kida. Graphene Oxide to B, N Co-doped Graphene through Tris-dimethylaminoborane Complex by Hydrothermal Implantation. American Journal of Materials Science 2019, 9(1): 22-28. DOI: 10.5923/j.materials.20190901.04. (**Q0, IF=0**).

23. Nasiruddin, Md. Kamruzzaman, Md. Razu Ahmed, Md. Anwaruzzaman, Md. Lawshan Habib, **Md. Abdul Mannan**. Spectrofluorimetric determination of bovine serum albumin

using enoxacin-aluminium (III) as a fluorescence probe. American Journal of Biochemistry, 8 (5) (2018): 100-105. doi:10.5923/j.ajb.20180805.03 (**Q0, IF=0.353**).

24. Md. Motahar Hossain, Md. Abul Bashar, Md. Nuruzzaman Khan, Pijush Kanti Roy, **Md. Abdul Mannan**, Md. Siddik Ali, Md. Akhter Farooque. Physical and Spectral Characterization of Ni (II), Cu (II), Co (II), and Cd (II) Complexes with Schiff Base of Salicylaldehyde and 2-Aminopyridine Towards Potential Microbial Application. American Journal of Applied Chemistry 6(4), (2018): 147-155. DOI: 10.11648/j.ajac.20180604.13 (**Q0, IF=0.447**).

25. **Md. Abdul Mannan**, Md. Saddam Hossain, Md. Al-Amin Sarker, Md. Motahar Hossain, Liton Chandra, ABM Hamidul Haque, and Md. Kudrat-E-Zahan. Bioaccumulation of Toxic Heavy Metals in Fish after Feeding with Synthetic Feed: A Potential Health Risk in Bangladesh. Journal of Nutrition and Food Sciences 2018, 8:5. DOI: 10.4172/2155-9600.1000728 (**Q0, IF=1.65**)

26. M.R. Ahmed, Nasiruddin, M.A. Alim, N. Jaman, M.A. Islam, S.A. Begum, M.M. Rahman, M.F. Ahmed, **Md. Abdul Mannan**. Facile and Rapid Synthesis of Arylidene Derivatives by Microwave Assisted $NH_4OAc$ Catalyzed Under Solvent Free Condition. Organic Chemistry: Current Research. (2018),7:3.DOI: 10.4172/2161-0401.1000194. **(Q0, IF=1.97).**
27. Md. Saddam Hossain, A.S.M.E. Shaheed, Md. Nuruzzaman Khan, Md. Abdul Mannan, M.M. Haque, C. M. Zakaria, Ranjan K Mohapatra, Md. Kudrat-E-Zahan. Synthesis and Characterization of Cu(II) and Co(II) complexes containing Schiff base ligands towards Potential Biological Application. JCBPS; Section A, (2018), Vol. 8, No. 4; 654-668. DOI: 10.24214/jcbps.A.8.4.65468 (**Q0, IF=3.362**).

28. Mst. Sadia Afrin Dalia, Farhana Afsan, Md. Saddam Hossain, **Md. Abdul Mannan**, M. M. Haque, and Md. Kudrat-E-Zahan. Spectral and Thermal Characterization of Mn(II), Ni(II) and Zn(II) Complexes Containing Schiff Base Ligands Towards Potential Biological Application. Asian Journal of Chemical Sciences, 4(4): 1-11, 2018; Article no. AJOCS.42355, ISSN: 2456-7795. DOI: 10.9734/AJOCS/2018/42355 (**Q4, IF=0.5**).

29. **Md. Abdul Mannan**, Yudai Hirano, Armando T. Quitain, M. Koinuma, Tetsuya Kida. Boron doped graphene oxide: synthesis and application to glucose responsive reactivity. International Journal of Current research. 10 (11) (2018) 75335-75340. DOI: https://doi.org/10.24941/ijcr.33162.11.2018, (**Q0, IF=**)

30. Islam MJ, Amin MR, Ahmed MF, Khatun S, Rahman ML, Siddiqui SA, Rahman MA, Kudrat-E-Zahan M and **Mannan MA**. In-vitro Antimicrobial Activity of Essential Oils and Different Organic Extracts of Lippia alba. Journal of Phytochemistry & Biochemistry. Volume 2 (1) 1000107 (2018).

31. **Md. Abdul Mannan**, Md. Zakir Hossen, Zahidul Islam, A.B.M. Hamidul Haque , Md. Kudrat-EZahan, Shahed Zaman. Assessment of Antioxidant Properties of the Medicinal Plant *Abroma augusta* Linn. (Sterculiaceae) Leave. Bangladesh Journal of Industrial Microbiology and Biotechnology 2017; 1(2): 69-77.

32. Md. Saddam Hossain, **Md. Abdul Mannan**, F. K. Camellia, A. K. B. Zaman, C. M. Zakaria, Md. Kudrat-E-Zahan. Isoniazid Containing Metal Based Drugs as Potential Antimicrobial Agent: A Short Review. Science Journal of Chemistry, 5(5); (2017): 62-70. DOI: 10.11648/j.sjc.20170505.11 (**Q0, IF=0.5**).

33. **Md. Abdul Mannan**, Md. Samsul Alam, Farhana Mustari, Md. Kudrat-E-Zahan, Roushown Ali, ABM. Hamidul Haque, Shahed Zaman, and Debashish Talukder. *In vitro* Antioxidant, Antimicrobial, Insecticidal and Cytotoxic Activities of the Medicinal Plants: *Allamanda cathartica* and *Mimusops elengi*. European Journal of Medicinal Plants, 20(4); (2017): 1-12. **DOI: 10.9734/EJMP/2017/35730 *(*Q0, IF=0.106*)***

34. **Md. Abdul Mannan**, Zahidul Islam, Md. Jakir Hossen, ABM Hamidul Haque, Md. Kudrat-E-Zahan, Shahed Zaman, Debashish Talukder. Evaluation of Antimicrobial, Antifungal, and Cytotoxic Properties of *Abroma augusta* Linn. Asian Journal of Chemical Sciences, 3(2), (2017): 1-7. DOI: 10.9734/AJOCS/2017/35638 (**Q0, IF=0.5**)

35. Suman C. Mohanta, ABM Hamidul Haque, **Md. Abdul Mannan**, Shahed Zaman, Asif Iqbal, Dehashish Talukder. Antibacterial activities of nitrogen and sulfur containing macro cyclic compounds. Journal of Jessore University of Science and Technology, 1 (1); (2017): 59-66.

36. Md. Saddam Hossain, Md. Ashraful Islam, C. M. Zakaria, M.M. Haque, **Md. Abdul Mannan**, Md. Kudrat-E-Zahan. "*Synthesis, Spectral and Thermal Characterization with Antimicrobial Studies on Mn(II), Fe(II), Co(II) and Sn(II) Complexes of Tridentate N,O Coordinating Novel Schiff Base Ligand",* Journal of Chemical, Biological and Physical Sciences Section A, 6(4); (2016): 041-052. (**Q0, IF=3.362**)

37. **Md. Abdul Mannan**, Md. Saifullahhel Ali Azom, Babul Hasan, Md. Kudrat-E-Zahan, A B M Hamidul Haque. "*New Flavonoid Glycoside from the Medicinal Plant Vitex negundo",* Journal of Chemical, Biological and Physical, Sciences, Section B, 6; (2016): 1115-1119. (**Q0, IF=1.310**)

38. **Md. Abdul Mannan**, Farhana Mustari, Md. Shamim Hossain, Md. Khalid Hassan, Md. Kudrat-E-Zahan, ABM. Hamidul Haque, Shahed Zaman. "*Determination of Essential and Harmful Heavy Metals in Some Typical Medicinal Plants Grown in Bangladesh*", Journal of Chemical, Biological and Physical Sciences, Section A, 6; (2016): 291-920. (**Q0, IF=3.362**).

39. **M.A. Mannan**, Y. Baba, T. Kida, M. Nagano, H. Noguchi. "*Synthesis of Hexagonal Boron Carbonitride without Nitrogen Void Defects*", Materials Sciences and Applications. 6; (2015): 353-359. DOI: 10.4236/msa.2015.65041 (**Q0, IF=1.34**).

40. Rakesh Chandra Ray, Md. Kudrat-E-Zahan, M.M. Haque, Md. Abdul Alim, Md. Moffaserul Alam, Md. Sher Ali, **M.A. Mannan**, and Md. Akhter Farooque. "*Synthesis and Characterization with Antimicrobial activity of Cu(II), Ni(II) and Zn(II) metal complexes of Schiff base derived from o-aminophenol/ethylenediamine and Cinnamaldehyde*", Asian Journal of Research in Chemistry, 8(9); (2015): 545-547. DOI: 10.5958/0974-4150.2015.00091.7 (**Q0, IF=0.617**).

41. MA. Bashar, **MA. Mannan**, MF. Hossen, MS. Islam, MKE. Zahan, "*The synthesis,*

*characterization and biological activity investigation of mixed ligand Coordinated Ni(II)Complexes*", Asian Journal of Research in Chemistry. 8(1); (2015): 55-58. DOI: 10.5958/0974-4150.2015.00012.7 **(Q0, IF=0.617).**

42. Mahbubur Rahman, Shahed Zaman, A B M Hamidul Haque, **Md. Abdul Mannan,** Debashish Takulder. "*Antimicrobial and insecticidal activities of Corchorus capsularis seed extract*". Asian Journal of Research in Chemistry and Pharmaceutical Sciences. 3(3); (2015): 111-117. (**Q0, IF=2.73**)

43. Mamunur Rashid, Anwar Hossain, Shahed Zaman, A.B.M. Hamidul Haque, **Md. Abdul Mannan**, Debasish Talukder. "*Characterization and antioxidant assay of new compound isolated from Acacia nilotica fruit*". Asian Journal of Research in Chemistry and Pharmaceutical Sciences. 3(3); (2015): 103-109. (**Q0, IF=2.73**)

44. Anwar Hossain, Mamunur Rashid, Shahed Zaman, A.B.M. Hamidul Haque, **Md. Abdul Mannan**, Raqibul Islam, Debasish Talukder. "*Antioxidant, antimicrobial and insecticidal activities of Acacia nilotica fruit of Bangladesh*". University Journal of Zoology, Rajshahi University. 33; (2014): 49-55.

45. A B M Hamidul Haque, **Md. Abdul Mannan**, Shahed Zaman, Abdul Jalil Mia, Asif Iqbal, Debashish Talukder. "*Antibacterial activities of –S-S- bonded NNSS containing macro cyclic compounds*". University Journal of Zoology, Rajshahi University. 33; (2014): 77-83.

46. **M.A. Mannan**, M.A. Mottaleb, "*A low cost bio-sorption method for the removal of arsenic*", Rajshahi University Journal of Science and Engineering. 4; (2013): 1-8.

47. **M.A. Mannan**, Y. Baba, N. Hirao, T. Kida, M. Nagano, H. Noguchi, "*Hexagonal nanocrystalline BCN films grown on Si (100) substrate studied by X-ray absorption spectroscopy*". Materials Sciences and Applications. 4; (2013): 11-19. doi: 10.4236/msa.2013.45A003 (**Q0, IF=1.34**).

48. **M.A. Mannan,** Y. Baba, T. Sekiguchi, I. Shimoyama, N. Hirao, M. Nagano, H. Noguchi,**"***Orientation of One-dimensional Silicon Polymer Films Studied by X-ray Absorption Spectroscopy***"** Journal of Nanomaterials. doi:10.1155/2012/528256: Vol. 2012, (2012). (**Q2, IF=3.79**).

49. **M.A. Mannan**, Y. Baba, I. Shimoyama, N. Hirao, H. Noguchi, T. Kida, M. Nagano, "*Orientation of B–C–N hybrid films deposited on Ni (111) and polycrystalline Ti substrates explored by spectroscopy*". Thin Solid Films. 519; (2011): 1780–1786. https://doi.org/10.1016/j.tsf.2010.09.052 (**Q2, IF=2.0**)

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(2010): 4163–4169. https://doi.org/10.1016/j.tsf.2009.11.086 (**Q2, IF=2.0**).

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60. M.A. Mottaleb, M.S. Uddin, **M.A. Mannan**, M.N. Islam, M. Jesmin, "*Determination and mitigation of Arsenic in Drinking Water of Barind Region in Bangladesh*". Oriental Journal of Chemistry. 15; (1999): 479–484. (**Q0, IF= 0.6**).

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*dependent NEXAFS*", Photon Factory Activity Report 2010 # 28, Part B, p. 70, (2011).

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68. **M.A. Mannan**, "*Synthesis and structural analysis of B–C–N hybrid films and related low-dimensional materials*" JAEA Special Seminar, Feb. 24, 2010. (Ref. http://wwwapr.kansai.jaea.go.jp/srrc/02/).

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73. **MA. Mannan**, M. Nagano, N. Hirao, Y. Baba, *"Synthesis and characterization of oriented hexagonal BCN films by RF plasma enhanced chemical vapor deposition"*. The 1st Saga University (Japan) and Daegu University (Korea) Joint Seminar. January 23, 2008, Abstract p.L-5.

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81. Y. Baba, T. Sekiguchi, I. Shimoyama, M. Honda, N. Hirao, A. Narita, **M.A. Mannan**. *"Real-time observation of electronic structure and orientation at nanometer scale for silicon polymers"*. 11th International Conference on Electronic Spectroscopy and Structure, October 6 –10, 2009 Nara, Japan. Abstract p. 74.

82. **MA. Mannan**, M. Nagano, N. Hirao, Y. Baba. *"NEXAFS and XPS studies on the hexagonal boron carbonitride films synthesized by radiofrequency plasma CVD"*. The 3rd symposium on synchrotron radiation research in JAEA. February 28-29, 2008 (Spring-8), p. 307-308.

83. **MA. Mannan**, Y. Baba, T. Sekiguchi, I. Shimoyama, N. Hirao, A. Narita, M. Nagano, H. Noguchi, "*Molecular orientation of silicon polymer thin film evaporated on indium tin oxide surface*" The 23rd Conference of Japan Society for Synchrotron Radiation, 6-9 Januray, 2010, Himeji, Japan. Abstract p. 66.

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## Attended National/International Conferences for Paper Presentation:

1. D. D. Mazumder, N. R. Raheb, Mirza H. K. Rubel, **M. A. Mannan**, M. B. Uddin, and Tanzid Hasan: First-Principles Investigation of Mechanical, Electronic, Thermophysical, and Optical Properties of Aluminate Sodalites $Al_6X_4TeO_{12}$ (X = Ca, Cd) for Optoelectronic and Thermal Applications. 2nd International Conference on Recent Advances in Science and Technology. 14-15 November 2025, Faculty of Science, University of Rajshahi, Bangladesh. Abstract book page no. 251-252.

2. **Md. Abdul Mannan***, Mirza Humaun Kabir Rubel: Ag-functionalized h-bn nano-hybrid: solvothermal synthesis, multifunctional characterizations and anti-microbial activity assessment. IUPAC 50th World Chemistry Congress (50WCC) Kuala Lumpur, July 12-19, 2025. Abstract reference: 2336, Abstract book page No. 350.

3. **Md. Abdul Mannan**: Synthesis of Silver/Irone Functionalized Magnetic h-BN Nano-Composite for Improved Biomedical Applications. International Bioscience Conference and Carnival 2025 (ICBC), Abstract book pp. 75, 76. May 2025.

4. Md. Saddam Hossain, Md. Abdul Latif, Md. Tariqul Islam, **Md. Abdul Mannan**, Md. Faruk Hossen, Md. Ali Asraf, Md. Kudrat-E-Zahan. D3-22, Synthesis, DFT Calculations, Antibacterial, and Molecular Docking Study of Metal Complexes Containing Schiff Base Ligand, Conference: International Bioscience Conference and Carnival 2025 (ICBC), DOI: 10.13140/RG.2.2.16836.54409, May 2025.

5. Md. Ashraful Islam, Faria Tasnim, Md. Faruk Hossen, Md. Ali Asraf, **Md. Abdul Mannan** and Md. Kudrat-E-Zahan. TSSC-OP7: Copper(II), Nickel(II) And Cobalt(II) Metal Complexes With N-(Napthalene-1-ylmethylene) Isonicotinohydrazide As Novel Therapeutic Agents, Conference: International Bioscience Conference and Carnival 2025 (ICBC), DOI: 10.13140/RG.2.2.16521.97122, May 2025.

6. **Md. Abdul Mannan**, Mirza Humaun Kabir Rube, Md. Kudtat-E-Zahan: Solvothermal synthesis of Ag doped h-BN: Its characterizations and anti-microbial activity assessment, 2nd International Conference on Recent Advances in Chemistry (ICRAC-2024), Department of Chemistry, Jagannath University, Bangladesh, January 31-February 01, **2025**. Abstract Book, IL-C-02, Page No.30 (Invited talk).

7. **Mirza Humaun Kabir Rube***, **Md. Abdul Mannan***, Nafis Niyaz Tamim: Melt Quenching Synthesis, Structural Characterizations to Study the Effect of Lead on the Physical Properties of Borosilicate Glasses, 2nd International Conference on Recent Advances in Chemistry (ICRAC-2024), Department of Chemistry, Jagannath University, Bangladesh, January 31-February 01, **2025**. Abstract Book, IL-C-03, Page No.31-32.

8. Nasiruddin, Md. Saddam Hossain, **Md. Abdul Mannan**, Md. Kudrat-E-Zahan: Study of some major nutrients and trace elements in medicinal plant tulsi, International Conference on Recent Advances in Chemistry, Jagannath University, Dhaka, February **2020**. Abstract no. PP-F-04.

9. Kismat Ara Elachi, Md. Saddam Hossain, A.A.S.M. Zahid, Md. Nasiruddin, **Md. Abdul Mannan**, Md. Kudrat-E-Zahan: Bioactive complexes of Mg(II), Zn(II), Sn(II),

Vo(II) and Bi(III) ions containing Shiff base: spectral and thermal characterization with antimicrobial activity, International Conference on Recent Advances in Chemistry, Jagannath University, Dhaka, February **2020**. Abstract no. OP-B-04.

10. **Md. Abdul Mannan,** Tetsuya Kida,**:** Nitrogen Sulfur Co-doped Reduced Graphene Oxide: Synthesis and Characterization, Bangladesh Chemical Society Conference-**2019**, November 9-10, Rajshahi University, (PN-OP-02) Abstract page no. 55.

11. Liton Chandra, A.B.M. Hamidul Haque, Md. Kudrat-E-Zahan, **Md. Abdul Mannan**: Assessment of Micronutrients, Antioxidant and Cytotoxicity of *Averrhoa bilimbi*. Bangladesh Chemical Society Conference-**2019**, November 9-10, Rajshahi University, (PP-04) Abstract page no. 60.

**12.** Nur Mohammad, Md. Nur Amin Bitu, Sharif Uddin, Md. Saddam Hossain, Yeamin Reza, **Md. Abdul Mannan**, Md.Kudrat-E- Zahan: Structural properties of Copper(II) complex containing schiff base ligand, 2-salicylidene amino benzoic acid. Bangladesh Chemical Society Conference-**2019**, Rajshahi University, Bangladeah.

13. **Md. Abdul Mannan***, Md.Kudrat-E- Zahan, Kida Tetsuya. Boron Doped Graphene Oxide: Synthesis and Application to Glucose Responsive Reactivity. Recent Advances in Material Science and Technology (RAMST-2019). Government College of Engineering, Keonjhar, Odisha, India. (**Invited speaker**).

14. Md. Saddam Hossain, **Md. Abdul Mannan**, Mostofa Zahid, Md Nuruzzaman Khan, Md.Nasiruddin, Choudhury Md. Zakaria, Md.Kudrat-E- Zahan. Thermal Properties of Synthesized Schiff Base Metal Complexes: Spectrochemical Correlations. Recent Advances in Material Science and Technology (RAMST-2019). Government College of Engineering, Keonjhar, Odisha, India.

15. **Md. Abdul Mannan**, Md. Saddam Hossain, Md.Kudrat-E- Zahan, Md. Al-Amin Sarker. Bioaccumulation of toxic heavy metals in fish after feeding with synthetic feed: a potential health risk in bangladesh. Conference: Bangladesh Chemical Congress 2018, Dhaka University. October 2018.

16. Md. Anarul Islam, Md.shiraz U Ddaula, **Md. Abdul Mannan**, Md.Kudrat-E-Zahan. Spectroscopic investigation with antimicrobial screening of several transition metal complexes containing diethylenetriamine/triethylenetetramine and isatin derived Schiff base ligand. Conference: International Conference on Chemical Science & Technology, ICCST-Chem 2018. Khulna University of Science and Technology. February 2018.

17. Md. Saddam Hossain, Md.Ashraful Islam, Md. Masuqul Haque, **Md. Abdul Mannan**, Choudhury Md. Zakaria, Md.Kudrat-E- Zahan. Structural Properties and antimicrobial activity studies on some metal complexes containing N, O and S donor novel Schiff base ligand. Conference: Ist Symposium on Chemistry for Global Solidarity. Jagannath University, Dhaka, Bangladesh. October 2016.

18. **Md. Abdul Mannan,** Y. Baba, T. Sekiguchi, I. Shimoyama, N. Hirao, A. Narita, M. Nagano, H. Noguchi, "Molecular orientation of silicon polymer thin film evaporated on indium tin oxide surface" The 23rd Conference of Japan Society for Synchrotron Radiation, January 6–9, **2010**, Himeji, Japan. Abstract p. 66.

19. **Md. Abdul Mannan**: Synthesis and structural analysis of B-C-N hybrid films and related low-dimensional materials. JAEA Special Seminar, February 24, **2010**, Houkoukan, Synchrotron Radiation Research Center, Japan. (Ref. http://wwwapr.kansai.jaea.go.jp/srrc/02/).

20. **Md. Abdul Mannan**, Yuji Baba, I. Shimoyama, Norie Hirao, H. Noguchi, Masamitsu Nagano: Self-ordering of silicon polymer studied by polarization-dependence NEXAFS. The 27th PF Symposium. March 9-10, **2010** Tsukuba Congress Hall, Tsukuba, Japan. Abstract p. 70.

21. **Md Abdul Mannan**, Baba Y., Sekiguchi T., Shimoyama I., Hirao N., Narita A., Nagano M., Noguchi H., "*Self-ordering of silicon polymer studied by X-ray absorption spectroscopy*". The 90th Annual Meeting of the Chemical Society of Japan, March 26–29, Osaka, Japan **2010**. Abstract: E1-44.

22. **Md. Abdul Mannan**, Yuji Baba, I. Shimoyama, Norie Hirao, H. Noguchi, Masamitsu Nagano: Effect of substrates on the molecular-orientation of hexagonal B-C-N hybrid films. European Conference on Surface Science (Ecoss26), Auditorium Paganini Centro Congressi, Parma Italy, August 30-September 4, **2009**. Abstract page 11-12.

23. **Md. Abdul Mannan**, Yuji Baba, T. Sekiguchi, I. Shimoyama, Norie Hirao, Aymi Narita, Masamitsu Nagano, Hideyki Noguchi: Self-ordering of silicon polymer thin film grown on indium tin oxide surface. Eleventh International Conference on Electronic spectroscopy & structure, Nara, October 6-10, **2009**, Japan. Abstract no. 8APO9, page no. 179.

24. **Yuji Baba**, T. Sekiguchi, I. Shimoyama, Mitsunori Honda, Norie Hirao, Norie Hirao, Aymi Narita, **Md. Abdul Mannan**: Real-time observation of electronic structure and orientation at nanometer scale for silicon polymer. Eleventh International Conference on Electronic spectroscopy & structure, Nara, October 6-10, **2009**, Japan. Abstract no. 8BP26, page no. 74.

25. **Md. Abdul Mannan**, Masamitsu Nagano, Norie Hirao, Yuji Baba: Synthesis and characterization of oriented hexagonal BCN films by RF plasma enhanced chemical vapor deposition. The 1st Saga University and Daegu University Joint Seminar on New Trends in Chemistry and Biology, January 23, **2008**, Japan. Abstract page no. L-5.

26. **Md. Abdul Mannan**, Masamitsu Nagano, Norie Hirao, Yuji Baba: NEXAFS and XPS studies on the hexagonal boron carbonitride films synthesized by radiofrequency plasma CVD. 3rd JAEA Synchrotron Radiation Research Symposium, Japan Atomic Energy Agency, Kansai Photon Science Institute/Synchrotron Radiation Research Centre, February 28-29, **2008**, SPring-8, Japan. Abstract page no. 307.

27. **Md. Abdul Mannan**, Masamitsu Nagano, Tetsuya Kida, Norie Hirao, Yuji Baba: XPS and NEXAFS studies on oriented hexagonal BCN film. 21st Kitakyushu Fall Meeting of the Ceramic Society of Japan, September 17-19, **2008**. Abstract page no. 124.

28. **Md. Abdul Mannan**, Tetsuya Kida, Masamitsu Nagano, Norie Hirao, Yuji Baba: Atomic arrangement, composition and orientation of hexagonal BCN films synthesized

by radiofrequency plasma enhanced CVD. The 25th International Korea-Japan Seminar on Ceramics, November 19-21, **2008**, Kangnung Korea. Abstract page, 164.

29. **Md. Abdul Mannan**, Masamitsu Nagano, Tetsuya Kida, Norie Hirao, Yuji Baba: Hybrid BCN films were prepared from tris-dimethylamino borane as precursor by RF plasma enhanced chemical vapor deposition. The Annual Meeting of The Ceramics Society of Japan, March 21-23, **2007**. Abstract page no. 282.

30. **Md. Abdul Mannan**, Masamitsu Nagano, Norie Hirao, Yuji Baba: Characterization of hexagonal boron carbonitride (h-BCN) films prepared by RF plasma enhanced CVD. The 24th International Japan-Korea Seminar on Ceramics, November 20-22, **2007**, Kakegawa, Shizuoka, Japan. Abstract Page no. 289-292.

31. **Md. Abdul Mannan**, Tetsuya Kida, Masamitsu Nagano: Plasma enhanced chemical vapor deposition of B-C-N films. The 3rd Kyushu-Busan/Kyungnam Joint Symposium on Advanced Ceramics, December 14-15, **2006**, Nagasaki University, Nagasaki, Japan, Abstract page 9-10.

## Conducted Supervisions:

1. Ashrafun Nahar: M.Sc. degree awarded (2022).
   Title of the Thesis: Studies on Groundwater Quality of Rajshahi University Campus: Health Concerns Issues of Public Health.
2. Toshar Hossain: M.Sc. degree awarded (2022) in vitro antioxidant and phytochemical studies on neolamarckia cadamba and tamarindus indica.
3. Md. Zamil Khan: M.Sc. degree awarded (2020).
   Title of the Thesis: Graphene oxide-Poly (2-dimethylamino)ethyl methacrylate Nanocomposite: Synthesis, Characterization and dye adsorption ability.
4. Amina khatun: M.Sc. degree awarded (2020).
   Title of the Thesis: Evaluation of macro, macro nutrients and trace elements in some leafy vegetables of Bangladesh
5. Nurun Nahar Nipa: M.Sc. degree awarded (2019).
   Title of the Thesis: Functionalization of hexagonal boronitate(h-BN) with silver diethyldithiocarnamate by thermal process at different temperature and it's characterization
6. Liton Chandra: M.Sc. degree awarded (2018).
   Title of the Thesis: *Averrhoa bilimbi*: A prospective source of bioactive compounds against antimicrobial and cytotoxic activity.
7. Farhana mostari: M.Sc. degree awarded (2013).
   Title of the Thesis: Investigation of the plant *mimusops elengi* and evaluation of antioxidant and biological activities.

## Conducted Research Projects of Science Faculty of Rajshahi University:

1. As principal investigator. (FY: 2023-24)
   Title of the Project: Evaluation of Macro and Micro Nutrients as well as toxic trace elements in Some Selected Herbal Plants of Bangladesh: A Nutritional and Medicinal Potency for Public Health.
2. As principal investigator: (FY: 2021-22)
   Title of the Project: Determination of Essential and Harmful Heavy Metals in Some Typical Medicinal Plants in Bangladesh.
3. As principal investigator. (FY: 2020-21)
   Title of the Project: Assessment of macro and micro nutrients in Holy basil (Tulsi): A possible supplement for natural medicine.
4. As principal investigator. (FY: 2018-19)
   Title of the Project: Assessment of antimicrobial activity and quantitative assay of essential minerals of *Carissa carandas* (Karamch) and *Averrhoa bilimbi* (Bilumbi) fruits of Bangladesh.
5. As principal investigator. (FY: 2017-18)
   Title of the Project: Determination of heavy metals concentration accumulation in fish samples after feeding of synthetic fish feed: Quality and health concern aspects of Bangladesh.
6. As co-investigator. (FY: 2012-13)
   Title of the Project: Chemical and Biological Investigation of some Medicinal Plants Specially *Vitex neganda* and *Wedalia chinessis*.

## Awards and Recognitions:

**(1). Fellowship for Follow-up Program**
*Kumamoto University, Japan*
*January 2017 – March 2017*
Awarded a short-term research fellowship for postdoctoral follow-up collaboration.

**(2). JAEA Fellowship for Special Research Students**
*Japan Atomic Energy Agency (JAEA), Tokai-mura, Japan*
*April 2009 – March 2010*
Selected as a special research fellow to conduct advanced research in materials science.

**(3). Monbukagakusho (MEXT) Scholarship – Ph.D. Program**
*Saga University, Japan*
*October 2007 – September 2010*
Prestigious Japanese government scholarship for doctoral studies in Energy and Materials Science.

**(4). Monbukagakusho (MEXT) Scholarship – M.Eng. Program**
*Saga University, Japan*

*October 2005 – September 2007*
Awarded for master's studies in Chemistry and Applied Chemistry.

**(5). Shaheed Hobibur Rahman Gold Medal**
*University of Rajshahi, Bangladesh, 1998*
Awarded for achieving first-class honors in B.Sc. (Hons.) in Chemistry.

**(6). Government Scholarship – Secondary School Certificate (SSC)**
*Rajshahi Education Board, Bangladesh, 1990*
Awarded for exceptional academic performance at the SSC level.

**(7). Government Scholarship – Class Eight Public Examination**
*Rajshahi Education Board, Bangladesh, 1986*
Received for outstanding results in the junior scholarship examination.

## REFERENCES

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