

## DR. MD. ABDUL KHALEQUE



### Office Address

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### Residence Address

Flat No. 5A, House No. 264/1, Block C,  
Bashundhara Residential Area,  
Dhaka-1229

### EDUCATION

- **Ph.D., 2003**, Shinshu University, Nagano, Japan, **Liposomal Chemistry**
- **M.Sc., 1996**, University of Dhaka, Dhaka, Bangladesh, **Organic Chemistry**
- **B.Sc., 1995**, University of Dhaka, Dhaka, Bangladesh, **Chemistry**
- **Higher Secondary Certificate, 1992**, Govt. Azizul Haque College, Bogra, **Science**
- **Secondary School Certificate, 1990**, Narina BL High School, Shahzadpur, Sirajgonj, **Science**

### DOCTORAL DISSERTATION

**Field:** Liposomal Chemistry

**Thesis Supervisor:** Professor Michiharu Mitani (Ph.D.) and Professor Dr. Yukihisa Okumura, (Ph.D.), Department of Chemistry and Material Engineering, Faculty of Engineering, Shinshu University, Japan

#### **Outcomes:**

Development of a simple method of liposome preparation by Egg PC

A method to immobilize liposome on polymer gel particles through hydrophobic interaction was developed.

A method to immobilize liposome on polymer gel particles by *In-situ* bond formation was developed.

Detachable immobilization was established

The stability of the liposome was proved by using a marker FITC-dextran with the help of fluorescence spectrophotometry and UV-Visible spectrophotometry.

## **Research experience**

**Postdoctoral Research, Department of Imaging Science, Pukyong National University, South Korea, June 2009 - May 2010**

Investigated fabrication of a hybrid consists of gold nanoparticles and multi walled carbon nano tubes (MWCNTs) with the help of poly (amino acid). The monomer and polymer were characterized by <sup>1</sup>HNMR. The morphology of the polymer powder was analyzed by Scanning Electron Microscopy (SEM; Hitachi S-2400). The attachment of AuNPs on the surface of MWCNTs was confirmed by direct observation under Transmission Electron Microscope (TEM).

Prepared conducting rubber composites of ethylene propylene diene M-class rubber (EPDM) with multi walled carbon nanotubes (MWCNTs) and organo-clay, Cloisite<sup>®</sup>15A to develop flexible strain sensitive materials. The compounding for the composites was performed in Brabender internal mixer. Morphology of the composites was examined by TEM. The microscopic pictures of MWCNTs were obtained by using a Field Emission Scanning Electron Microscope (FESEM). The mechanical properties, such as the moduli, the TS and the elongation at break, were examined in a Universal Testing Machine (UTM, KSU Co., Korea, Model; KSU-05M-C) according to ASTM D412.

Developed a method for the preparation of composites of Poly (DL-lactide) and surface modified silica nanoparticles by solution blending.

Investigated solid state polymerization of acryloyl β- alanine and methacryloyl β- alanine using supercritical CO<sub>2</sub>.

## **MASTER'S Thesis**

**Field:** Organic synthesis

**Thesis Supervisor:** Professor Dr. M. Giasuddin Ahmed, Dept. of Chemistry, University of Dhaka.

**Outcomes:**

Synthesized several biologically active compounds

The synthesized compounds were characterized by melting point, UV-Visible Spectrophotometry, IR Spectrophotometry, <sup>1</sup>H NMR Spectrophotometry

## **PROFESSIONAL EXPERIENCE**

- **Associate Professor, May 25, 2014-Present**  
Department of Environmental Science, SESM, IUB
- **Assistant Professor, January 2005-May 24, 2014**  
Department of Environmental Science, SESM, IUB
- **Postdoctoral Research Fellow, June 2009 - May 2010**  
Department of Imaging Science, Pukyong National University, South Korea

- **Lecturer, March 2004- December 2004**  
Department of Chemistry  
Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
- **Lecturer, September 2003-March 2004**  
Department of Chemistry  
Dhaka University of Engineering and Technology (DUET), Gazipur, Dhaka,  
Bangladesh

### **AWARDS / HONORS**

- Awarded Brain Korea 21(BK 21) fellowship by the South Korean Government from June 2009 to May 2010.
- Awarded Japan Government scholarship (Monbusho) from October 1999 to March 2003.
- Awarded Scholarship and book prize for securing the highest marks in Master of Science in Chemistry, Department of Chemistry, University of Dhaka, Bangladesh.
- Awarded Abu Sadat Talent Scholarship in the Department of Chemistry, University of Dhaka, Bangladesh.
- Received Dhaka University Merit Scholarship for securing the second highest marks in Bachelor of Science in Chemistry, Department of Chemistry, University of Dhaka, Bangladesh.
- Achieved Educational Scholarship provided by the Board of Education, Government of Bangladesh at Higher Secondary level.
- Awarded Scholarships provided by the Board of Education, Government of Bangladesh for High School and Primary School Scholarship examination.

### **ONGOING RESEARCH PROJECT**

- Occurrence of Persistent Organic Pollutants in Food grains in Urban Areas of Bangladesh. Radiant Pharmaceuticals Ltd has provided a research grant for this work.
- Removal of Reactive Dyes from Textile Wastewater by Using Renewable Bio-Adsorbents
- Status of Air quality in Dhaka city
- Measurement of noise level in Dhaka city

### **RESEARCH PROJECT COMPLETED AT IUB**

- Occurrence of persistent organic pollutants in breast milk in urban areas of Bangladesh. The research work was supported by radiant pharmaceuticals ltd.
- Assessment of water quality in the River, Buriganga. The work was funded by IUB.
- Application of biomaterials for treating wastewater. The work was funded by IUB.
- Heavy metals in biofertilizers used in Bangladesh. The work was funded by IUB.
- Completed a number of student's senior research projects funded by IUB on climate change, air quality, water quality etc.

## **PUBLICATIONS**

1. SS Ahammed, S Tasfina, KA Rabbani and **MA Khaleque**, An Investigation Into The Water Quality of Buriganga - A River Running Through Dhaka, *International Journal of Scientific & Technology Research* **5(3)**, 36-41 (Mar 2016).
2. **MA Khaleque** and DK Roy, Removing Reactive Dyes from Textile Effluent Using Banana Fibre, *International Journal of Basic & Applied Sciences IJBAS-IJENS* Vol:16 No:01
3. SS Ahmmed, MA Hossain, MZ Abedin, **MA Khaleque**, A Study of Environmental Impacts on the Coral Resources in the Vicinity of the Saint Martin Island, Bangladesh, *International Journal of Scientific & Technology Research* **5(1)**, 37-39 (Jan 2016).
4. MR Awual, MM Hasan, GE Eldesokyc, **MA Khaleque**, MM Rahman, M Naushad, Facile mercury detection and removal from aqueous media involving ligand impregnated conjugate nanomaterials, *Chemical Engineering*, **290**, 243-251 (2016).
5. MR Awual, MM Hasan, **MA Khaleque**, MC Sheikh, Treatment of copper(II) containing wastewater by a newly developed ligand based facial conjugate materials, *Chemical Engineering Journal*, **288**, 368-376 (2016).
6. MR Awual, MM Hasan, **MA Khaleque**, Efficient selenium (IV) detection and removal from water by tailor-made novel conjugate adsorbent, *Sensors and Actuators B: Chemical*, **209**, 194-202 (2015).
7. MR Awual, **MA Khaleque**, Y Ratna, H Znad, Simultaneous ultra-trace palladium (II) detection and recovery from wastewater using new class meso-adsorbent, *Journal of Industrial and Engineering Chemistry*, **21**, 405-413 (2015).
8. A Shahat, MR Awual, **MA Khaleque**, MZ Alam, M Naushad, Large-pore diameter nano-adsorbent and its application for rapid lead (II) detection and removal from aqueous media, *Chemical Engineering Journal*, **273**, 286-295 (2015).
9. MR Awual, M Ismael, **MA Khaleque**, T Yaita, Ultra-trace copper (II) detection and removal from wastewater using novel meso-adsorbent, *Journal of Industrial and Engineering Chemistry*, **20** (4), 2332-2340 (2014).
10. MR Awual, Ismail MM Rahman, T Yaita, **MA Khaleque** and M Ferdows, pH dependent Cu (II) and Pd (II) ions detection and removal from aqueous media by an efficient mesoporous adsorbent, *Chemical Engineering Journal*, **236**, 100-109 (2014).
11. MR Awual, **MA Khaleque**, M Ferdow and T Yaita, Rapid recognition and recovery of gold (III) with functional ligand immobilized novel mesoporous adsorbent, *Microchemical Journal*, **110**, 591-598 (2013).
12. **MA Khaleque**, LT Bao Tran, SS Hong, SY Seo, HG Kim, and KT Lim, fabrication of gold nanoparticle/multi walled carbon nanotube hybrids by in situ reaction in water using poly (acryloyl  $\beta$ -alanine), *Journal of Nanoscience and Nanotechnology*, **12**, 4384-4387 (2012).

13. IP Kang, **MA Khaleque**, YJ Yoo, PJ Yoon, SY Kim, and KT Lim, Preparation and properties of ethylene propylene diene rubber/multi walled carbon nanotube composites for strain sensitive materials, *Composites: Part A*, **42**, 623–630 (2011).
14. **MA Khaleque**, Y Okumura and M Mitani, Liposome Immobilization on cross-linked polymer gel by in situ formation of cleavable covalent bonds, *Journal of Bioactive and Compatible Polymers*, **21**, 539-555 (2006).
15. **MA Khaleque**, Y Okumura, S Yabushita and M Mitani, Detachable immobilization of liposomes on polymer gel particles, *Colloids and Surface B: Biointerfaces, Elsevier*, **37**, 35-42 (2004).
16. **MA Khaleque**, Y Okumura, S Yabushita and M Mitani, Liposome immobilization on polymer gel particles by in situ formation of covalent linkages, *Chem. Lett.*, 2003 (416).
17. **MA Khaleque**, T Oho, Y Okumura, and M Mitani, Controlled detachment of immobilized liposomes on polymer gel support, *Chem. Lett.*, 2000 (1402).

### **Books Written**

- General Science for Class VI, Published by National Curriculum and Text Book Board (NCTB), Bangladesh.
- General Science for Class VII, Published by National Curriculum and Text Book Board (NCTB), Bangladesh.
- General Science for Class VIII, Published by National Curriculum and Text Book Board (NCTB), Bangladesh.
- General Science for Class IX-X, Published by National Curriculum and Text Book Board (NCTB), Bangladesh.
- General Science for Class IX-X (English Version), Published by National Curriculum and Text Book Board (NCTB), Bangladesh.

### **Papers Presented in Conferences/Seminars**

- MA Khaleque and KT Lim “Introduction of silica nanoparticles as a filler in biodegradable poly (DL- Lactide)”, the 2009 International Conference on Nano Science and Nano Technology, 5-6 Nov, 2009, Mokpo National University, South Korea.
- MA Khaleque, LTB Tran and KT Lim, “Fabrication of polymer functionalized multi walled carbon nanotubes by gold nano particles”, Spring Meeting, The polymer society of Korea, April 10-11, 2010, Daejeon DCC, South Korea.
- MA Khaleque, LTB Tran and KT Lim, “ Poly-acryloyl  $\beta$ - alanine with different physical properties by different synthetic methods” Spring Meeting, The polymer society of Korea, April 10-11, 2010, Daejeon DCC, South Korea.

- MA Khaleque, LTB Tran and KT Lim “Solid state polymerization of acryloyl  $\beta$ - alanine and methacryloyl  $\beta$ - alanine using supercritical CO<sub>2</sub>”, the 4<sup>th</sup> KSIEC Meeting, 5-6 Nov, 2009, Mokpo National University, South Korea.
- MA Khaleque, LTB Tran and KT Lim “Fabrication of gold nano-particle/multi walled carbon nanotube hybrids by *in situ* reaction in water using poly (acryloyl  $\beta$ -alanine)”, The 21<sup>st</sup> International Conference on Molecular Electronics and Devices, May 19-20, 2010, Suncheon National University, South Korea.
- MA Khaleque, S Bashar and MA Hossain, “Characterization of domestic wastewater in Bangladesh and its possibility of reusing”, The International Conference on Environment (ICENV 2008), 15-17<sup>th</sup> December, 2008, Penang, Malaysia.
- MA Khaleque, KR Dey, A Rabbani and PK Sarker, “Detachable immobilization of liposomes on polymer gel particles”, Singapore International Chemistry Conference 5(SICC5), 16-19<sup>th</sup> December, 2007, Suntec Singapore international Convention and Exhibition Centre, Singapore.
- MA Khaleque, T Oho, Y Okumura, and M Mitani, Immobilization of liposomes and their controlled detachment from the gel support, Oral presentation in the first conference of Aseanian Membrane Society, National Museum of Emerging Science and Innovation, Tokyo, Japan.
- MA Khaleque, T Oho, Y Okumura, and M Mitani, controlled detachment of the immobilized liposomes from polymer gel support, Poster presentation in the 51st regular meeting of Polymer presentation, Yokohama, Japan.
- MA Khaleque, Y Okumura, S Yabushita, S Iwasawa and M Mitani, Immobilization of giant liposomes on cross-linked polymer gel particles, Poster presentation in the 14th Polymer Gel Research Symposium, Tokyo University Conference Hall, Tokyo, Japan.

### **SHORT COURSES/WORKSHOP/CERTIFICATION:**

- Workshop on Capewater Project, CNRD, 9-13 May, 2016, Cologne, Germany.
- Workshop on Curriculum Development on Masters in Natural Resources Management, 22-25<sup>th</sup> September, 2015, Kenyaatta University, Nairobi, Kenya.
- 35<sup>th</sup> Annual Conference of Bangladesh Chemical Society (BCC2012), 07-09<sup>th</sup> December, 2012, University of Dhaka and BCSIR, Dhaka, Bangladesh.
- Seminar on Designated Reference Institute for Chemical Measurements, 20<sup>th</sup> November, 2014, BCSIR, Dhaka.
- Inaugural Environmental Olympiad 2012, 30<sup>th</sup> June, 2012, NSU, Dhaka, Bangladesh.
- 34<sup>th</sup> Annual Conference of Bangladesh Chemical Society (BCC2011), March, 2012, Diploma Engineers Institution, Dhaka, Bangladesh.
- 31<sup>st</sup> Annual Conference of Bangladesh Chemical Society (BCC2008), 30<sup>th</sup> January-01 February 2008, University of Dhaka, Bangladesh.

- 30<sup>th</sup> Annual Conference of Bangladesh Chemical Society (BCC2007), 15 March 2008, Chittagong University, Bangladesh.
- Celebration of International Year of Sanitation, 2008, 4-5 March 2008, Bangladesh-China Friendship Conference Centre, Dhaka, Bangladesh.
- 29<sup>th</sup> Annual Conference of Bangladesh Chemical Society (BCC2006), 9-11 March, 2007, University of Dhaka and BCSIR, Dhaka, Bangladesh. Chemical Congress 2006, Organized by Bangladesh Chemical Society, 09-11 March, 2007, TSC, Dhaka University, Dhaka, Bangladesh.
- Scoping of a follow-on Air Quality Management Project, Organized by Department of Environment, Ministry of Forest and Environment, 16<sup>th</sup> May, 2006, IDB Bhaban, Agaogaon, Dhaka, Bangladesh.
- National Seminar on Indoor air Pollution, Health and Household Energy, Organized by WHO, South-East Asia Region, 21<sup>st</sup> June, 2006, IDB Bhaban Agaogaon, Dhaka, Bangladesh.
- 9<sup>th</sup> International Conference on Computer and Information Technology, 21<sup>st</sup> December 2006, Bangladesh-China Friendship Conference Centre, Dhaka, Bangladesh.
- Conference on World Environment Day, Organized by Department of Environment, Ministry of Forest and Environment, 5th June, 2005, Bangladesh-China Friendship Conference Centre, Dhaka, Bangladesh.
- Chemical Congress 2004 Organized by Bangladesh Chemical Society, 10-12 December, 2004, TSC, Dhaka University, Dhaka, Bangladesh.
- Workshop on Curriculum Development on Masters in Natural Resources Management in Kenyatta University, Kenya, 21-22 October, 2015, Kenyatta University Conference Centre, Nairobi, Kenya.
- Training on Effective Teaching and Learning, 19<sup>th</sup> January, 2012, IUB, Dhaka, Bangladesh.
- Course in Writes Without Borders Introductory Course in writing about public health, 5<sup>th</sup> January, 2008, IUB, Dhaka, Bangladesh.
- International Workshop on Arsenic Contamination and Safe water, 11-13 December, 2005, Auditorium, Atomic Energy Centre, Dhaka, Bangladesh.
- Teachers Appreciation Workshop, 2004, Conference Hall, BUET, Dhaka, Bangladesh.
- Workshop on Scoping of a follow-on Air Quality Management Project, Organized by Department of Environment, Ministry of Forest and Environment, 16th May, 2006, IDB Bhaban, Agaogaon, Dhaka, Bangladesh.
- Workshop on Scientific Methodology and Development organized by BCAS and IFS at BCAS, 9-10 April, 2008.

## **SERVICES:**

### **M.Sc. Theses supervised at IUB**

- Kazi Kamrul Hassan (ST. ID # 1027007); Preparation of environmental performance evaluation guideline for textile sector in Bangladesh.
- Tariq Hasan (ST ID # 1017004; Dialogue as a tool in managing trans-boundary water issues.
- Shahzerin Bashar (ST. ID #9710820); Characterization of domestic wastewater and its prospects of recycling.
- Kazi Rashed Hyder (ST. ID # 0717006); Appropriate option for potable water in saline affected coastal areas.
- Shamim Alam (ST. ID # 1221745); Removal of reactive dyes from textile waste water by renewable textile dust and pea nut husk.
- Lutfor Rahman (ST. ID # 1221759); A method for removing reactive dyes from textile effluent by using hogla leaf and aman rice husk.
- Ariful Islam (ST. ID# 1110951); Occurrence of persistent organic pollutants in breast milk.
- Debashih Kumar Roy (ST. ID# 1211317); Removing reactive dyes from textile effluent using banana fibers

### **Supervision of senior projects/internships**

Have been supervising a number of senior projects and internships on various topics such as electronic waste management, lake water quality in Dhaka city, water pollution level in the river Buriganga, effects of climate change etc.

### **Community Activities**

Have been organizing student's field trips, Seminars, Rallies with the help of the students and faculty members of SESM. These activities help the students to have practical knowledge as well as to achieve management skills, leadership skills and communication skills. Those are also effective to expose IUB.

### **Computer Skills**

Skilled at MS Word, MS Excel, MS Power Point, Origin 8, Chemdraw etc.



## **PROFESSIONAL AFFILIATIONS:**

- Dean, School of Environmental Science and Management, IUB, January 2016- Present
- Head, Department of Environmental Science, SESM, IUB, July 01, 2015- Present
- Member, Academic Council, IUB, July 01, 2015- Present
- Member, Admission Committee, IUB, July 01, 2015- Present
- Member, Committee of Courses, SESM, IUB

## **Membership of Scientific Societies**

- Life member, Bangladesh Chemical Society
- Former Member, Polymer Society, Japan
- Former Member, Aseanian Membrane Society
- Former Member, Polymer Society, South Korea

## **Personnel Information**

Date of Birth: February 01, 1975

Nationality: Bangladeshi

Marital Status: Married

## **References**

1. Professor Dr. Abu Jafar Mahmood  
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2. Professor Dr. Yukihsa Okumura  
Department of Chemistry and Material  
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**Date: June 15, 2016**