Md Aslam Uddin

Resume

PhD Candidate (*Expected graduation on Summer 2020*)
Department of Chemistry, University of Kentucky
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Highly self-motivated and detail-oriented with more than 5 years of research and teaching/mentoring experience. Having strong research experience in semiconducting materials with emphasis on synthesis, modifications, and applications in optoelectronics (specially, photovoltaics) which are heavily characterization-based research. Able to work independently as well as in a highly collaborative & team-oriented environment.

EXECUTIVE SUMMARY

- More than 5 years of research and teaching experience
- Synthesis of semiconducting quantum dots (QDs) as well as macro-and nano-materials
- Fabrication of thin films and photovoltaics
- Surface modification of QDs/nanomaterials and thin films
- Material characterization

SKILLS

- Teaching/mentoring
- Project management
- Safety/inventory/waste management
- Synthesis as well as optimizing synthetic methods and optical properties of semiconducting materials
- Fabrication and characterization of photovoltaics
- Characterization of optical properties using UV-vis, Fluorometer, and TRSPC
- Phase and structure characterization using SEM/TEM and XRD
- Sample analysis using FTIR, Raman, and NMR (casually used)
- Surface and energy level characterizations using XPS and UPS (casually used)

EDUCATION — YEAR

University of Kentucky, Lexington, KY, USA — **2015-Present**
PhD Candidate in Analytical & Material Chemistry
(Expected Graduation in Summer 2020)
Advisor: Kenneth R. Graham

University of Dhaka, Dhaka, Bangladesh — **2010-2011**
MS in Physical Chemistry, 2011
Thesis Title: "*Synthesis of Zinc Oxide Nano-structures and the Effects of Stabilizing Polymers on Their Size and Stability*"
Advisor: Mohammad Yousuf Ali Mollah

University of Dhaka, Dhaka, Bangladesh — **2005-2010**
BS in Chemistry, 2010

PROFESSIONAL APPOINTMENTS — YEAR

Graduate Assistant, University of Kentucky, USA — **2015-Present**
Senior Chemistry Teacher, Bangladesh International Tutorial (BIT), Dhaka, Bangladesh — **2012-2015**

RESEARCH INTERESTS

Areas: Synthesis of quantum dots (QDs), nanomaterials, & micromaterials; surface chemistry/modification of QDs, nanomaterials, and thin films; and fabrication of thin films & optoelectronic devices (specially, photovoltaics)
Goals: Synthesizing and post-modifying nanomaterials and micromaterials for fabricating effective optoelectronic devices.

RESEARCH EXPERIENCES — YEAR

- "Enhancing Durability of Mixed Inorganic-organic Based Perovskite ($Cs_{0.15}FA_{0.85}PbI_3$) Photovoltaics by Application of Surface Ligands" (*University of Kentucky*) — **2019-Present**
- "Dodecanethiol Treated Ultrastable Colloidal $CsPbBr_3$ Nanoparticles: Slow Transformation of Nanocrystals to Nanoplates with High photoluminescence Quantum Yields" (*University of Kentucky*) — **2019-Present**
- "Synthesis of Highly Luminescent $CsPbX_3$ (X = Cl, Br, and I) Nanoplates *Via* Ligand-AlX_3 Mediated Anion Exchange of $CsPbCl_3$ nanocrystals at Room Temperature" (*University of Kentucky*) — **2019-Present**
- "Mechanistic Exploration of Dodecanethiol Treated $CsPbBr_3$ Nanocrystals with Photoluminescence Quantum Yields Reaching ~100%" (*University of Kentucky*) — **2017-2019**

- "Halide Exchange and Surface Modification of Metal Halide Perovskite Nanocrystals with Alkyltrichlorosilane" (*University of Kentucky*) **2017-2018**
- "Reducing Atmosphere and Surface Treatments of Indium Tin Oxide for Enhancing Stability and Power Conversion Efficiency of $CsSnI_3$ Photovoltaics" (*University of Kentucky*) **2016-2017**
- "Synthesis of Group XVI Metal Chalcogenide Nanomaterials and Application of These Nanomaterials for Thermoelectric Characterization" (*University of Kentucky*) **2015-2016**
- "Synthesis of Zinc Oxide Nano-structures and the Effects of Stabilizing Polymers on Their Size and Stability" (*University of Dhaka*) **2010-2012**

PEER-REVIEWED PUBLICATIONS — YEAR

- "Enhancing Durability of Mixed Inorganic-organic Based Perovskite ($Cs_{0.15}FA_{0.85}PbI_3$) Photovoltaics by Application of Surface Ligands" **In preparation**
- "Dodecanethiol Treated Ultrastable Colloidal $CsPbBr_3$ Nanoparticles: Slow Transformation of Nanocrystals to Nanoplates with High photoluminescence Quantum Yields" **In preparation**
- "Synthesis of Highly Luminescent $CsPbX_3$ (X = Cl, Br, and I) Nanoplates *Via* Ligand-AlX_3 Mediated Anion Exchange of $CsPbCl_3$ nanocrystals at Room Temperature" (*University of Kentucky*) **Submitting**
- "Mechanistic Exploration of Dodecanethiol Treated $CsPbBr_3$ Nanocrystals with Photoluminescence Quantum Yields Reaching ~100%" based on surface modification of $CsPbBr_3$ nanocrystals has recently been published in ***JPCC*** on 21st June **2019**. Here is **DOI: 10.1021/acs.jpcc.9b05612.** **2019**
- "Halide Exchange and Surface Modification of Metal Halide Perovskite Nanocrystals with Alkyltrichlorosilane" based on anion exchange reaction of $CsPbX_3$ NCs has been published in ***RSC Nanoscale*** on 27th August **2018**. Here is **DOI:10.1039/C8NR04763D**. **2018**

VERBAL PRESENTATIONS — YEAR

- "Anion Exchange and Surface Treatment of Colloidal $CsPbBr_3$ Nanocrystals with Alkyltrichlorosilane" at Spring MRS, Phoenix, Arizona, USA **2019**
- "Halide Exchange and Surface Modification of Metal Halide Perovskite Nanocrystals" at ARGO Symposium, CAER, University of Kentucky **2018**

POSTER PRESENTATIONS — YEAR

- "Halide Exchange in Metal Halide Perovskite Nanocrystals Using Alkyltrichlorosilane" at Naff Symposium, University of Kentucky, Kentucky, USA **2018**
- "Synthesis of Zinc Oxide Nanostructures and the Effects of Stabilizing Polymers on Their Size and Stability" at International Workshop on Nanotechnology, University of Dhaka, Dhaka, Bangladesh **2012**

COURSES TAUGHT — YEAR

CHE 113 General Chemistry Laboratory **Fall 2017, 2015**
CHE 113 General Chemistry Laboratory **Spring 2019, 2018, 2017, 2016**
CHE 111 General Chemistry Laboratory **Fall 2016**
IGCSE Chemistry **2012-2015**

HONORS & AWARDS — YEARS

Nominee of Dean's Competitive Fellowships (*UKy*) **2018**
Outstanding Oral Qualifier Award (*UKy*) **2017**
Chair's Scholarship (*UKy*) **2015**
Selected Lecturer of Chemistry (*NTRCA, Ministry of Education, BD*) **2010**

OUTREACH ACTIVITIES/AFF. — YEAR

STEM Camp **2019, 2018, 2017**
Vice President of MRS UK-Chapter **2019**

REFEREEES

Kenneth R. Graham
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Assistant Professor
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