

Dr. Munir Ullah Khan

Department of Chemistry
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Education

- May 2018–Mar 2020* **Bilkent University**
Postdoctoral Researcher
Advisor: Professor Dr. Emrah Ozensoy
- Sep 2012 – Jul 2017* **University of Science and Technology of China** (World Ranking = 97)
PhD, Chemistry
(with highest honors)
Hefei, Anhui Province, China
Advisor: Professor Dr. Jie Zeng
PhD Thesis: “Synthesis of Bimetallic Pt₃Co Alloy Nanocrystals for Heterogeneous Hydrogenation of CO₂ to Methanol”
- Sep 2011 – Jul 2012* **Anhui Normal University**
HSK Certificate, Chinese Language
(with highest honors)
Wuhu, Anhui Province, China
- Mar 2005– Sep 2010* **Gomal University**
Doctor of Pharmacy
Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan
Adviser: Assistant Professor Saifullah Khan
Project Report: “Management of Cancer at Shaukat Khanum Memorial Cancer Hospital & Research Centre Lahore”

Work Experience

- * Currently working as Post-Doc at Department of Chemistry, Bilkent University, Ankara, Turkey
- * Worked as Assistant Professor at Kohat University of Science and Technology
- * Five years experience as Lecturer and research associate at University of Science and Technology of China from (Sep 2011- Aug 2016)
- * Worked as President USTC Foreign Students Association from (Jun 2016- Jul 2017)
- * Worked as Quality Assurance manager for one year in Spadix Pharmaceuticals Rawat Islamabad from (Aug 2010- Jul 2011)
- * Six Weeks Clerkship at Shaukat Khanum Memorial Cancer Hospital and Research Centre Lahore
- * Six Weeks Clerkship at District Head Quarter Teaching Hospital Bannu

Research Experience

Sep 2012 – Jul 2017

USTC - Hefei National Laboratory for Physical Sciences at the Microscale Heterogeneous catalysis in petrochemical engineering and chemical industry

Catalysis has long relied on noble metals to facilitate a wide variety of chemical transformations. On the most basic level nanocrystals of noble metals are attractive for use as catalysts because of their high surface to volume ratios which can minimize the costs associated with their usage. Such nanocrystals have been employed to catalyze oxidation, cross coupling, electron-transfer, hydrogenation reactions, and so on. Both the reactivity and selectivity of a catalyst can be tailored by controlling the shape of a nanocrystal.

The ultimate goals of this research are

- To develop metallic and bimetallic nanocatalysts with well-defined facets
- To study catalytic reaction mechanisms and elementary-step kinetics on such nanocatalysts under realistic pressure conditions using transient kinetic techniques
- To understand the relationship between surface, structure, interface, composition, activity, stability and durability

Specifically, we mainly focus on energy-related catalytic reactions including syngas reactions, CO₂ hydrogenation to methanol and biomass reactions.

Skills & Activities

<i>Skills</i>	Nano-Catalysis, NMR Spectroscopy, IR, Hydrogenation, Nanoparticles Synthesis, Physical Chemistry, Fuel Cells, Inorganic Synthesis, Carbon Dioxide, Electron Transfer
<i>Languages</i>	Chinese, English, Pashto, Urdu
<i>Computer skills</i>	Interpretation skills in 2D NMR (COSY, HMBC and HMQC). Expert in Data Entry, MS Office applications (Word, Excel, Power Point etc), Data Base, Computer Hardwar and Poster as well as Power Point presentation skills. MS Office (MS Word, MS Excel, MS PowerPoint)
<i>Scientific Memberships</i>	Associate Member of Royal Society of Chemistry (AMRSC) Chinese Academy of Science (CAS) Member of American Chemical Society CAS-TWAS Fellow
<i>Interests</i>	Volleyball, Badminton, Cricket, Hiking

Journal Publications

- [1] **Munir Ullah Khan**, Liangbing Wang, Zhao Liu, Zehua Gao, Shengpeng Wang, Hongliang Li, Wenbo Zhang, Menglin Wang, Zhengfei Wang, Chao Ma, and Jie Zeng. "Pt₃Co Octapods as Superior Catalysts of CO₂ Hydrogenation." *Angewandte Chemie International Edition* 55, no. 33 (2016): 9548-52. (SCI Impact factor 11.994)
- [2] **Munir Ullah Khan**, Liangbing Wang, Zhao Liu, Zehua Gao, Shengpeng Wang, Hongliang Li, Wenbo Zhang, Menglin Wang, Zhengfei Wang, Chao Ma, and Jie Zeng. **Inside Cover:** "Pt₃Co Octapods as Superior Catalysts of CO₂ Hydrogenation." *Angewandte Chemie International Edition* 55, no. 33 (2016): 9444-9444.
- [3] Zhang, Wenbo, Liangbing Wang, Haoyu Liu, Yiping Hao, Hongliang Li, **Munir Ullah Khan**, and Jie Zeng. "Integration of Quantum Confinement and Alloy Effect to Modulate Electronic Properties of RhW Nanocrystals for Improved Catalytic Performance toward CO₂ Hydrogenation." *Nano Letters* 17, no. 2 (2017): 788-93. (SCI Impact factor 12.712)
- [4] Zhang, Wenbo, Liangbing Wang, Kaiwen Wang, **Munir Ullah Khan**, Menglin Wang, Hongliang Li, and Jie Zeng. "Integration of Photothermal Effect and Heat Insulation to Efficiently Reduce Reaction Temperature of CO₂ Hydrogenation." *Small* 13, no. 7 (2017): 1602583-n/a. (SCI Impact factor 8.32)
- [5] Wang, Menglin, Liangbing Wang, Hongliang Li, Wenpeng Du, **Munir Ullah Khan**, Songtao Zhao, Chao Ma, Zhenyu Li, and Jie Zeng. "Ratio-Controlled Synthesis of CuNi Octahedra and Nanocubes with Enhanced Catalytic Activity." *Journal of the American Chemical Society* 137, no. 44 (2015): 14027-30. (SCI Impact factor 13.858)

Awards & Grants

<i>Nov 2016</i>	Award: Chinese Government Outstanding International Student Award It is really inspiring to get this valuable scholarship out of the fierce competition, and received a monetary award of 30000 RMB equivalents to 5000 USD. Winning of this scholarship has set an excellent example for all international students in USTC and will motivate them positively on working harder and harder towards their goals, as well as improve a better academic atmosphere.
<i>Sep 2013</i>	Scholarship: CAS-TWAS President Fellowship Award
<i>Feb 2012</i>	Grant: Research Travel Grant Program for university faculty and PhD scholars
<i>Sep 2011</i>	Scholarship: Chinese Government Scholarship for Pursuing PhD University Postgraduate Program
<i>Sep 2008</i>	Scholarship: Merit Scholarship
<i>Aug 2007</i>	Scholarship: Mora Scholarship for Excellent Students
<i>Dec 2005</i>	Scholarship: National Bank of Pakistan Excellent Student Scholarship

CONFERENCES/ SEMINARS ATTENDED

- * Attended seminar on “Towards reliable design of energy materials: electronic structure, stability and defects” on December 30, 2013 at Hefei National Laboratory for Physical Sciences at the Microscale, University of Science and Technology of China
- * Attended seminar on “Tailoring the Nanoscale Architecture of Electrocatalysts for Renewable Energy Conversion” by Dr. WANG Chao of Johns Hopkins University at University of Science and Technology of China on 25th June, 2014
- * Attended seminar on “Controlled Synthesis of Noble Metal Nanoparticles and Their Applications” by Prof. Lu Xianmao of National University of Singapore at University of Science and Technology of China on 29th October, 2014
- * Attended seminar on “Meeting the Challenges of Heterogeneous Catalysis Controlled at the Atomic Level” by Prof. Huang Wenyu of Iowa State University at Department of Chemistry, USTC China on 17th June, 2015
- * Attended workshop on “Multiscale Modeling of Materials for Renewable Energy Applications” by Prof. Gang Lv of California State University Northridge at Hefei National Laboratory, USTC China on 26th June, 2015
- * Attended one day seminar on career “Functional Energy Materials: From 1D and 2D Polymers to 3D Carbon Nanomaterials” by Prof. DAI Liming of Case Western Reserve University at Hefei National Laboratory, USTC China on 20th October, 2015
- * Attended seminar on “Rational design of photocatalysts for water splitting and CO₂ conversion” by Prof. TANG

Junwang of University College London, UK at Department of Chemistry, USTC China on 1st April, 2016.

- * Attended seminar on “Sustainable carbon materials for renewable energy application” 9th September, 2016 at Hefei National Laboratory, USTC China
- * Attended One day seminar on “Electrocatalysis of small molecules on metals and oxides” by Prof. XU Zhichuan of Nanyang Technological University at Department of Chemistry, USTC China on 27th September, 2016
- * Attended seminar on “Synthesis and Applications of Two Dimensional Nanomaterials” by Prof. ZHANG Hua of Nanyang Technological University, Singapore at Hefei National Laboratory, USTC China on 27th October, 2016
- * Attended seminar on “Self-Assembly of Nanoparticles: From Fundamentals to Chirality” by Prof. Nicholas A. Kotov of University of Michigan at Hefei National Laboratory, USTC China on 13th November, 2016
- * Attended seminar on “Shaping Bimetallic Nanostructures towards Functional Materials” by Prof. CHEN Jingyi of University of Arkansas at Hefei National Laboratory, USTC China on 20th December, 2016

ACHIEVEMENTS

- * First international student of my university (USTC) with very high quality peer reviewed scientific articles in world leading journals
- * Awarded the most prestigious “Chinese Government Outstanding International Student Scholarship” award for the year 2016
- * Paper was highlighted on USTC and other prestigious websites with title “Breakthrough in CO₂ Hydrogenation by Applying Sharp-tip Effect” on 08/08/2016
- * Elected as President USTC Foreign Students Association on 20/06/2016
- * Awarded with honorary title “Excellent Volunteer” of the 2016 orientation voluntary activity of University of Science and Technology of China (USTC)
- * Hosted the International Students New Year party “Better USTC and Better Life” at the International Conference Hall, East Campus on Dec 27 evening, 2013 and spent a memorable night in celebration of New Year
- * Better USTC and Better Life was highlighted on USTC Website as well as at China scholarship council Website
- * Active member of organizing committee of international students USTC sports gala 2015 and 2016
- * Picture was selected as cover page of USTC international students admission brochure
- * Won Scholarship from National Bank of Pakistan
- * Active member of AFSA (All Foreign Student Association) Hefei, Anhui
- * Active member of ICVG (International Cooperation Volunteer Group)
- * Highly proficient in Chinese language and actively taking parts in different Chinese cultural activities
- * Obtained research experience in a variety of industrial and academic environments including nanoparticles synthesis for renewable energy, pharmaceuticals, and organic materials
- * Synthesized a wide range of nanoparticles and metal organic frameworks for use in CO₂ hydrogenation to methanol

PROFESSIONAL REFERENCES

PROF. DR. JIE ZENG
Hefei National Laboratory for Physical Sciences at the Microscale
Department of Chemical Physics
University of Science and Technology of China
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PROF. DR. GUL MAJID KHAN
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