American Chemical Society Wichita Section

August 2021 Newsletter
Qiyang Zhang, Editor

Section Meeting

Thursday, 23 September, 7:00 PM
Wichita State University
Wichita, KS

Meal (optional) 6:00 PM

Dinner will be served in the Edmiston Room (room number 256) of Rhatigan Student Center at Wichita State University. Dinner buffet will include taco with ground beef and shredded chicken, fresh fried tortilla chips, and different toppings. The cost of the meal is $10 for regular members, and $5 for students who also attend the presentation. Directions and a campus parking map can be found at: https://www.wichita.edu/services/parking-1/parking-maps.php

Please RSVP by Wednesday, 22 September to Qiyang Zhang at qzhang2@emporia.edu.

Meeting 7:00 PM

The meeting and presentation will follow dinner and take place in the same location. If you cannot attend the meeting in person, please visit the link:

https://emporiastate.zoom.us/j/98675155039

Speakers Tendai Gadzikwa, Assistant Professor in the Department of Chemistry at Kansas State University.

Title *Metal-organic framework (MOF) materials as scaffolds for enzyme-inspired catalysts*

Abstract

A long-standing goal in the field of supramolecular chemistry is the construction of catalysts that more adequately mimic the active sites of enzyme, i.e catalysts whose active sites are (i) confined, (ii) highly functionalized, and (iii) flexible. To this end, our group has introduced metal-organic framework (MOF) materials as scaffolds on which we can deliberately organize complex chemical functionality within confined, 3-dimensional space. MOF materials are porous, crystalline solids with pores of small-molecule dimensions, and whose cavity environments are highly tailorable. While the pores of MOF materials can be decorated with a wide variety of chemical functionality, the ability to uniformly multifunctionalize MOF materials remains a challenge. This presentation will describe strategies we have developed for the construction of uniformly multifunctionalized MOF materials, and our progress towards the synthesis of enzyme-inspired catalytic materials.

Speaker Bio

Tendai Gadzikwa was raised in Harare, Zimbabwe. Tendai earned her B.A. in Chemistry in 2003 from Macalester College (St. Paul, MN) where she performed research in supramolecular chemistry under the supervision of Prof. Ron Brisbois. Her Ph.D. work was on the synthesis and modification of metal-organic framework materials (MOFs) and was jointly advised by Profs. Joe Hupp and SonBinh Nguyen at Northwestern University (Evanston, IL). Following her graduation in 2009, she undertook her Schlumberger Faculty of the Future postdoctoral fellowship at the Van 't Hoff Institute of Molecular Sciences (University of Amsterdam, Netherlands) in Prof. Joost Reek's Homogeneous Catalysis group. Tendai began her first faculty first position in 2012 as a Senior Lecturer at the University of Zimbabwe (Harare, Zimbabwe) before moving to Canada in 2015 to work on DNA-based materials as a visiting researcher in Prof Juli Gibbs' lab at the University of Alberta (Edmonton, AB). She established her independent lab at Kansas State University in 2016 where her group works on using MOFs as a scaffold on which supramolecular catalysis can be performed.

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Chair's Message

Dear Section Members,

It seems it has been a while since we last met in person. I am happy to tell you that we will have the opportunity to meet in person in September. This coming meeting includes our feature presentation by the awardee of the 65th Lindau Nobel Laureate Meeting Horst-Köhler Fellow, Assistant Professor Dr. Tendai Gadzikwa, with an interesting topic about metal-organic framework (MOF) materials. MOF has the huge potential in many applications, such as nanotechnology, molecular self-assembly processes, and smart materials. The process of making MOF materials is not an easy process. Coincidently, we also have the ACS-highlighted "Molecule(s) of the Week", cesium dodecaborate (see below). Cesium dodecaborate is an emerging catalytic material for

nanoparticles.

We will have a election for the Wichita Section – it is time to choose a new chair-elect for 2022, who will then become chair in 2023. Dr. Arvin Cruz, Professor of Chemistry at Fort Hays State University and former member of the section's leadership team, has volunteered to run for this position. I have not received any other nominations for the ballot, but of course we always include the option for a write-in candidate. The ballot will be distributed with another newsletter and I ask that you return it to me via email or snail mail by 15 October.

I hope to see you on September 23rd in Wichita.

Sincerely,

Qiyang Zhang, Chair, ACS Wichita Section

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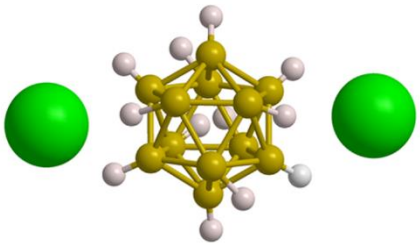
Molecule of the Week



Cesium dodecaborate

"I'm mostly boron, but you won't find me boring. What molecule am I?" Cesium dodecaborate is one of many known salts of polyborane anions. In 1960, Anthony R. Pitochelli and M. Frederick Hawthorne at Rohm and Haas's Redstone Arsenal Research Division (Huntsville, AL) prepared small amounts of some dodecaborate salts.

Thomas Schlied and co-workers at the University of Stuttgart (Germany) published the crystal structure of cesium dodecaborate in 2000. The crystals are colorless, face-rich cubic with B–B distances of 178 pm and B–H distances of 112 pm. Each cesium ion is in contact with 12 hydrogen atoms, each at a distance of 313 pm.

In recent years, scientists have been exploring practical applications of dodecaborate salts, such as in battery electrodes, catalysis, and sensors. In particular, a research team led by Haibo Zhang and Xiaohai Zhou at the University of Wuhan (China) have used cesium dodecaborate to prepare complex catalysts.

In 2018, the researchers reported the preparation of a class of core–shell magnetic gold nanocomposites with "raspberry-like" structures. Cesium dodecaborate played a dual role in preparing highly monodispersed gold nanoparticles (AuNPs). Cesium dodecaborate was used to immobilize the gold nanoparticles on the surface of a γCD@Fe_3O_4 substrate. The resulting composites made highly active and recyclable catalysts for the selective reduction of nitroaromatic compounds to the corresponding anilines.

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2021 Section Executive Committee

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Wichita Section Web Site
https://communities.acs.org/t5/Wichita-Local-Section/gh-p/wichita-ls