

OIST Seminar

Okinawa Institute of Science and Technology

SPEAKER

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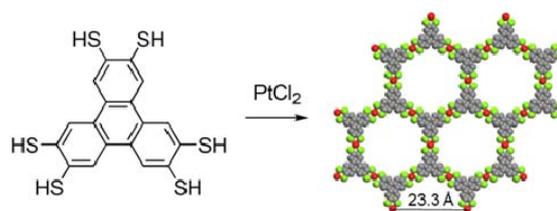
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Sulfur empowers porous frameworks: sensors, catalysts and a story of bridging the gaps

Monday, April 13, 2015 15:30 - 16:30

@ Meeting Room D015, Lab 1

Abstract: The gaps here include: the insulating gap in metal-organic frameworks (MOFs), and the gap in the synthetic strategies for porous metal-thiolate solids; both critically relevant to next-generation electronic and catalytic materials. We recount the quest for recipes—the ones broadly effective for tackling the intractable metal-sulfur link in network construction. In a hard-and-soft design, carboxyl and sulfur groups make for a versatile, stepwise approach: 1) hard ions like Zr(IV) selectively engages the carboxyl groups to set up the host net; 2) the dangling thiol donors can then take up metal guests and install the desired metal-sulfur links throughout the net. The other approach is simpler: it is a direct, one-pot reaction between metal ions and rigid, chelating aromatic thiols. The very rigid nature of the building blocks precludes close packing and enforces open, porous structures. The resultant metal-thiolate solids represent a class of covalent metal-organic frameworks (CMOF) that not only feature versatile electroactive and ion-exchange capabilities, but also serve to bridge the two parallel fields of MOFs and porous polymers.



Short Biography: **Zhengtao Xu** (徐政涛) is Associate Professor at City University of Hong Kong. He obtained BS from Peking University (1996), MS from University of Michigan at Ann Arbor (1998), and Ph.D. from Cornell University (2001). He was a postdoc with David B. Mitzi at IBM T. J. Watson Research Center from 2001-2003. Prior to moving his research program to City U, Dr. Xu was a tenure-track assistant professor at the George Washington University (2003-2005). Dr. Xu has been



awarded the PRF Starter Grant from the American Chemical Society (2004), the ORAU Ralph E. Powe Junior Faculty Enhancement Award (2004) and a Humboldt Research Fellowship for Experienced Researchers (2011; host: Prof. Markus Antonietti, MPI of Colloids and Interfaces, Potsdam). Our current work synergizes molecular syntheses and framework materials, i.e., porous polymer and metal-organic frameworks (MOF) for sensing, separation, catalysis and advanced optical/electronic applications.

For more information

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