

凝聚态物理前沿论坛第四十讲

题目: Engineering Ultrasmall Metal Nanoclusters for Biomedical and Environmental Applications

报告人: Prof. Jianping Xie (National University of Singapore)

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报告摘要:

In very recent years, ultrasmall metal nanoclusters with core sizes below 2 nm have emerged as a new class of functional nanoparticles due to their discrete and size dependent electronic structures and molecular-like properties, such as HOMO-LUMO transitions in optical absorption, quantized charging, and strong luminescence. Synthesis of high quality metal nanoclusters in sufficiently large quantities is necessary for establishing reliable size-property relationships and exploring their potential applications. This presentation will summarize our recent progress in the development of novel synthetic strategies for the production of atomically precise metal nanoclusters. The preparation of atomically precise metal nanoclusters is viewed as engineerable process where both the precursors (input) and their conversion chemistry (processing) may be rationally designed to achieve the desired outcome – atomically precise metal nanoclusters (output). We will demonstrate several efficient strategies for tailoring the precursor and the conversion process, and present our understanding of the processes involved. We will also highlight some application developments of metal nanoclusters in important sustainability topics including sensors for the environment and human health, and other biomedical applications.

报告人简介:

Dr. Jianping Xie received his B.S. and M.S. in Chemical Engineering Department from Tsinghua University. He graduated with Ph.D. from the Singapore-MIT Alliance program. He joined National University of Singapore as an Assistant Professor in 2010 and established the “Noble Metal Nanoclusters” research group. His major research interest is “engineering subnanometer metal nanoclusters for biomedical and environmental applications”. His group has extensive research experience on the design, synthesis, and applications of atomically precise gold and silver nanoclusters. He has >80 publications in peer-reviewed journals such as *Nat. Comm.*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*, *Acc. Chem. Res.*, *Adv. Mater.*, and *ACS Nano*. He has 4300+ citations with the H-index of 33.

