

第8回精密無機材料化学研究セミナー

演題 Emergent Photophysical Characteristics of Nanomaterials and Their Practical Applications

講師 Amitava Patra (Senior Professor, School of Materials Sciences, India)

日時 2026年6月12日(金) 15:00~16:00

場所 南総合研究棟2号館大会議室 (1階)

主催 多元物質科学研究所 精密無機材料化学研究部門



講演内容

Precisely doped metal nanoclusters (NCs) are emerging nanomaterials for their unique photophysical properties. The fundamental knowledge of these photophysical processes is crucial for developing efficient light-harvesting systems. The modulation in the excited state relaxation time mainly arises from the alteration in HOMO-LUMO energies due to central metal atom substitution. We have elucidated how the electronegativity of surface staple motifs modifies the electron-phonon coupling in metal clusters, using temperature-dependent spectroscopic measurements and global analysis of ultrafast spectroscopy. Again, we have opted for a gold-doped silver bimetallic cluster to explore the effect of doping in single-molecule systems. Here, we demonstrated the influence of ligand-to-metal charge transfer (LMCT) on fluorescence properties, and the optimal hydrogen adsorption energy and efficient charge-transfer kinetics are the reasons for the superior HER activity in metal clusters.

連絡先: 多元物質科学研究所 根岸雄一 (022-217-5604)