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

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日時　2026年6月12日(金) 14:00～15:00

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.

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