2026-2학기

화학과 Colloquium Seminar



Molecular Design Strategies for Ligands to Transition Metals and Redox-Active Organic Compounds

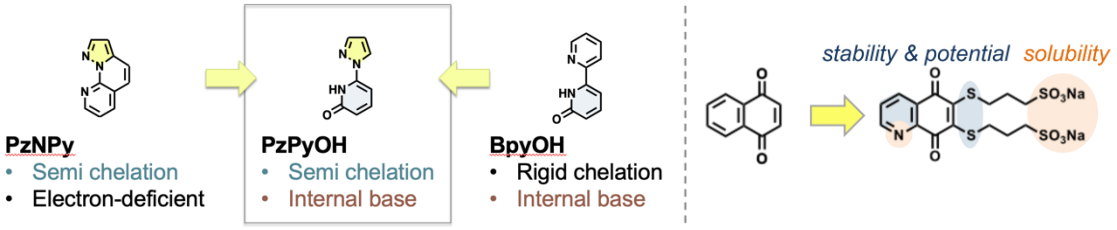
주정민 교수 | 경희대학교 화학과

○ **일시 : 2026. 11. 03. (화) 16:00**

○ **장소 : 5호관 507호**

○ **초록**

Heterocycles offer electronic and steric properties that can be tuned systematically through molecular design. We have used this tunability in two directions: ligands for transition-metal catalysis and redox-active organic materials. First, new classes of pyrazole-containing bidentate ligands were developed to enable Pd-catalyzed C–H functionalization of (hetero)arenes. Compared with strongly binding, rigid pyridine, pyrazole provides more flexible binding to Pd. The catalytic utility of these ligands was demonstrated in Pd-catalyzed aerobic C–H alkenylation and perdeuteration of (hetero)aromatic compounds. Second, the same design principles were extended to redox-active organic materials, whose applications have expanded from conventional optoelectronic devices to new electrochemical biosensors. Their performance depends on precise control of redox potential, stability, and solubility. In collaboration with electrochemists, we developed heterocycle-containing redox-active organic materials for redox-flow batteries and electrochemical biosensors. Heterocycles allowed systematic control of redox potential and stability, while pendant substituents and counterions were selected to increase solubility. These studies show how heterocyclic scaffold design connects catalyst development with electrochemical materials.



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문의 화학과 김진호 교수 | 032-835-8218, jinho@inu.ac.kr