Open PhD Position (FPI: 4 year contract)

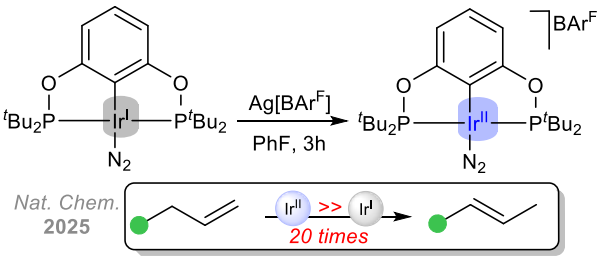
Organometallic Open-Shell Precious Metal Catalysts

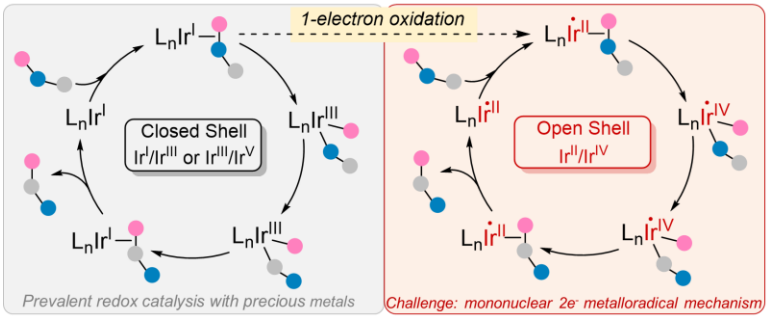
Institute for Chemical Research (IIQ), CSIC-Univ. of ***Sevilla (Spain)***. *PhD Advisor: Jesús Campos*

Group website: http://jcamposgroup.iiq.us-csic.es/

- **Project title: Unlocking the Potential of Open-Shell Precious Metal Catalysts (*RadicalCAT*)** (Ref.: PID2025-174897NB-I00)

- **Central hypothesis**: The vast majority of molecular catalysts based on precious metals rely on closed-shell configurations and well-established mechanisms. In contrast, open-shell configurations in base-metal catalysts have proven great potential to unlock unique reactivity and enhance catalytic efficiency. Recent results in our group demonstrated that a radical Ir(II) catalyst outperformed its widespread Ir(I) parent species in olefin isomerization via an open-shell Ir(II)/Ir(IV) redox cycle *(Nat. Chem.* **2025**, Figure left). On these bases, the main idea will be to ***develop novel open-shell precious metal catalysts based on highly congested environments, bimetallic structures and single-crystal to single-crystal reactivity that provide guiding principles to establish new open-shell catalysis based on precious metals*** (Figure, right).





- **PhD student training:** The PhD researcher will acquire profound training in synthesis of organometallic species and their application to catalysis. He/she will be responsible for synthesizing and characterizing ligands and complexes in close and open-shell configurations, carrying out reactivity studies, designing catalytic cycles and investigating reaction mechanisms. This will provide the student with a wide portfolio of experimental skills (handling air sensitive compounds, advanced NMR, XRD, EPR, CV, etc.).

Requirements. Bachelor and Master degree in Chemistry.

Eligibility. Experience in organometallic chemistry and characterization techniques will be valuable.

Conditions. 4-year contract and funded International Research Stay (3-6 months).

Application Process. Candidates must send a motivation letter, CV and the contact information of two referees to Jesús Campos (jesus.campos@iiq.csic.es). Shortlisted candidates will be interviewed online.

