

Applied Organometallic Chemistry (AOC)

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The group activity focuses on the design, synthesis, characterization and reactivity of selected classes of organometallic compounds with potential application as catalysts, as bioactive molecules or as active components for advanced materials and devices (luminescent devices, sensors, liquid crystals). The main target are late transition metal complexes with N-heterocyclic carbene ligands (NHCs). The structure and properties of the carbene ligands are matched to the metal centre to yield complexes with the desired properties. Ongoing research involves catalysts for C-H functionalizations and CO₂ valorization, functional complexes for cooperative catalysis or improved bioactivity, as well as NHC-stabilized molecular gold clusters. We also study the luminescent properties and self-assembly behaviours of organometallic compounds and their application in electrochemiluminescence and chemiluminescence.

1. *Dinuclear gold(I) complexes with N-phosphanyl, N-heterocyclic carbene ligands: synthetic strategies, luminescence properties and anticancer activity*, Dalton Trans., **2021**, 50, 13554 - 13560.
2. *Solvent-Driven Supramolecular Wrapping of Self-Assembled Structures*, Angew. Chem. Int. Ed., **2021**, 60, 5407-5413.
3. *Palladium(II)- η^3 -allyl complexes bearing N-trifluoromethyl N-heterocyclic carbenes: a new generation of anticancer agents that restrain the growth of high-grade serous ovarian cancer tumoroids*, Chem. Eur. J., **2020**, 26, 11868 - 11876.
4. *Novel Iridium complexes with N-heterocyclic dicarbene ligands in light-driven water oxidation catalysis: photon management, ligand effect and catalyst evolution*, Dalton Trans., **2020**, 49, 2696 - 2705.
5. *Single-Step Synthesis of Dinuclear Neutral Gold(I) Complexes with Bridging Di(N-heterocyclic carbene) Ligands and Their Catalytic Performance in Cross Coupling Reactions and Alkyne Hydroamination*, Organometallics **2018**, 37, 4213-4223.