Title	**Gold(I,III) complexes with N-heterocyclic carbene ligands for catalytic, biomedical and luminescence applications**
PI	TUBARO Cristina
Research Group	Applied Organometallic Chemistry – DiSC
Curriculum	Scienze Chimiche
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Project description:
The compounds, that we want to develop in this program, are based on two symbiotic units (Au centers and N-heterocyclic carbene ligands) that, combined together, afford organometallic complexes with enhanced catalytic efficiency, antiproliferative activity and luminescence properties. The strong NHC-Au bond prevents the potential decomposition of the complex under catalytic or physiological conditions. A library of NHC-Au complexes with variable nuclearity, Au oxidation state, nature, charge and functionalization of the ligands and counteranions will be prepared. The performance of the complexes as catalysts in technologically relevant transformations involving activation of C-C multiple bonds will be evaluated. Their use as anticancer agents will be also assessed, within national and international collaborations. Finally, the luminescence properties of the complexes, mainly due to the so-called aurophilic interaction, will be investigated.
The PhD student will acquire experience in the above mentioned application fields as well as in the synthesis of organometallic compounds in inert atmosphere (Schlenk procedures, dry–box) and in the techniques for their characterization (NMR, MS, X-ray crystal structure solving, absorption and emission spectra).
Publications:
1. M. Monticelli, M. Baron, C. Tubaro, S. Bellemin-Laponnaz, C. Graiff, G. Bottaro, L. Armelao, L. Orian, ACS Omega 2019, 4, 4192-4205.
2. M. Baron, A. Dall'Anese, C. Tubaro, L. Orian, V. Di Marco, S. Bogialli, C. Graiff, M. Basato, Dalton Trans. 2018, 47, 935-945.
3. M. Baron, C. Tubaro, M. L. C. Cairoli, L. Orian, S. Bogialli, M. Basato, M. M. Natile, C. Graiff, Organometallics 2017, 36, 2285-2292.
4. M. Monticelli, S. Bellemin-Laponnaz, C. Tubaro, M. Rancan, Eur. J. Inorg. Chem. 2017, 2488-2495.
5. M. Monticelli, C. Tubaro, M. Baron, M. Basato, P. Sgarbossa, C. Graiff, G. Accorsi, T. P. Pell, D. J. D. Wilson, P. J. Barnard, Dalton Trans. 2016, 45, 9540–9552.
Collaborations/Network:
Prof. Claudia Graiff (University of Parma), Dr. Marzio Rancan (CNR-ICMATE Padova) – X-ray crystal structure determination
Dr. Stéphane Bellemin-Laponnaz (CNRS-University of Strasbourg) – Ligand design
Dr. Gianluca Accorsi (CNR-NANOTEC Lecce), Dr. Gregorio Bottaro (CNR-ICMATE Padova) – Luminescence properties
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