ISTITUTO DI CHIMICA DEI COMPOSTI ORGANOMETALLICI

Consiglio Nazionale delle Ricerche

Venerdì 08/10/2021
alle ore 11.30

la Dr.ssa ANTONELLA GUERRIERO
Istituto di Chimica dei Composti Organometallici (ICCOM-CNR)
Sesto Fiorentino, Firenze

terrà il seguente seminario:

"The water soluble phosphines PTA and CAP: properties and applications of two similar but different ligands"

Il seminario sarà tenuto in modalità telematica, tramite accesso alla piattaforma GoToMeeting.

Si invitano tutti gli interessati a partecipare.

Dr. Francesco Vizza
Direttore ICCOM

Short Abstract:

Organophosphines are among the most common ancillary ligands used in organometallic chemistry due to their synthetic versatility and their ability to stabilize low metal oxidation states. The solubility in water can be obtained by modifying the phosphines structure and exploited for the application of the corresponding metal complexes in homogeneous aqueous biphasic catalysis. Among the few examples of neutral water soluble phosphines reported in the literature, the adamantane-like phosphine PTA (1,3,5-triaza-7-phosphadamantane) has been largely used to produce several PTA-based transition metal compounds with application in catalysis, photoluminescence and medicinal chemistry. After many years dedicated to the synthetic modification and the coordination chemistry of PTA, recently the interest of our research group switched to another phosphine ligand CAP (1,4,7-triaza-9-phosphatricyclo[5.3.2.1]tridecane), which is considered the higher homologue of PTA. Although structurally very similar, the two ligands show remarkable differences in their conformational behavior, reactivity and coordination chemistry. Taking into account our expertise on PTA chemistry, we started to explore the reactivity and the coordination ability of CAP, obtaining several ruthenium complexes. Some of them have been tested as catalyst precursors in homogeneous catalytic hydrogenations of few selected unsaturated substrates and in nitrile hydration reactions. Furthermore, the ruthenium(II)-arene CAP-containing complexes have been tested in vitro as cytotoxic compounds against selected cancer cell lines and compared to the most popular metallodrug RAPTA-C.

Short Biography:

Antonella Guerriero graduated in Pharmacy in 2005 (University of Florence) with the experimental project in medicinal chemistry “Design and synthesis of new heterocondensed pyridazinones derivatives with antiplatelet activity” and then she obtained a Master in “Drug Design and Synthesis” in 2006 (University of Siena) with the thesis “Fragment-Based approach for developing new metalloproteins inhibitors”. She received her PhD in chemistry in 2010 (University of Florence – ICCOM-CNR Florence) with the project “Novel PTA-derivatives as ligands for selective catalytic hydrogenation and hydroformylation reactions” and after some years as postdoc researcher at ICCOM-CNR in Florence, she got a permanent position as researcher in the same institute. As visiting scientist she has been at École Polytechnique Fédérale de Lausanne (EPFL, Switzerland), at the Department of Organic Chemistry and Technology in Budapest (Hungary) and Unité de Catalyse et de Chimie du Solide – CNRS in Lens Cedex and Université d’Artois in Lille (France). Her research interests range over organometallic chemistry, water-soluble ligands and their synthetic modifications, transition metal compounds, cage-like aminophosphines, homogeneous and aqueous phase catalysis. She is co-author of 22 peer-reviewed publications on ISI journals and 2 book chapters. She presented the results of her research activity to 18 national and international conferences as poster and oral communications.