

***Hybrid Catalysts: the Merging of
Organic and Inorganic Domains to
design New Functional Systems***

Dr. Marcella Bonchio

Università degli Studi di Padova, Italy

Friday 4th June, 2010. ICIQ Auditorium, 12 p.m.



Marcella Bonchio started her scientific activity at the University of Padova with an experimental thesis entitled: "Benzene Hydroxylation by vanadium (V) peroxocomplexes. Mechanistic and Synthetic aspects". In 1990, she joined the PhD school in Chemical sciences at the University of Padova, where she continued the work on metal-catalyzed processes, and mechanism elucidation, with a thesis entitled: "Homolytic Reactivity of Transition Metal Peroxocomplexes". In this period, M. Bonchio visited Professor J.O. Edwards's laboratories at Brown University, Chemistry Department, Providence, Rhode Island, U.S.A., pursuing a collaborative project on the speciation of competent metal-centered reactive intermediates.

As a postdoctoral associate, in 1995 M. Bonchio joined the laboratories of Prof. J. T. Groves, at Princeton University (N.J. U.S.A.), where she designed an innovative oxidation system, based on ruthenium perfluorinated porphyrin catalyst, with outstanding performance in hydroxylation and epoxidation reactions. In 1996, M. Bonchio continued the postdoctoral work in Padova, with a project on asymmetric catalysis by Ti(IV) and Zr(IV) complexes. In 1999, M. Bonchio moved her research activity in the field of Polyoxometalate clusters, contributing with the design innovative techniques for the high yield synthesis of ruthenium derivatives, their solution and solid state characterization, and screening of their catalytic activity. A recent breakthrough concerns the finding of a totally inorganic, POM-based, ruthenium species capable of water oxidation to dioxygen, with multi-turnover activity and fast catalysis.

The current research interests focus also on the design of hybrid POM catalysts, including chiral derivatives, at the interface with functional materials and nanotechnology.