Seminario

Università degli Studi di Padova
Dipartimento di Scienze Chimiche

Ciclo di Seminari 'Frontiers in Chemistry'

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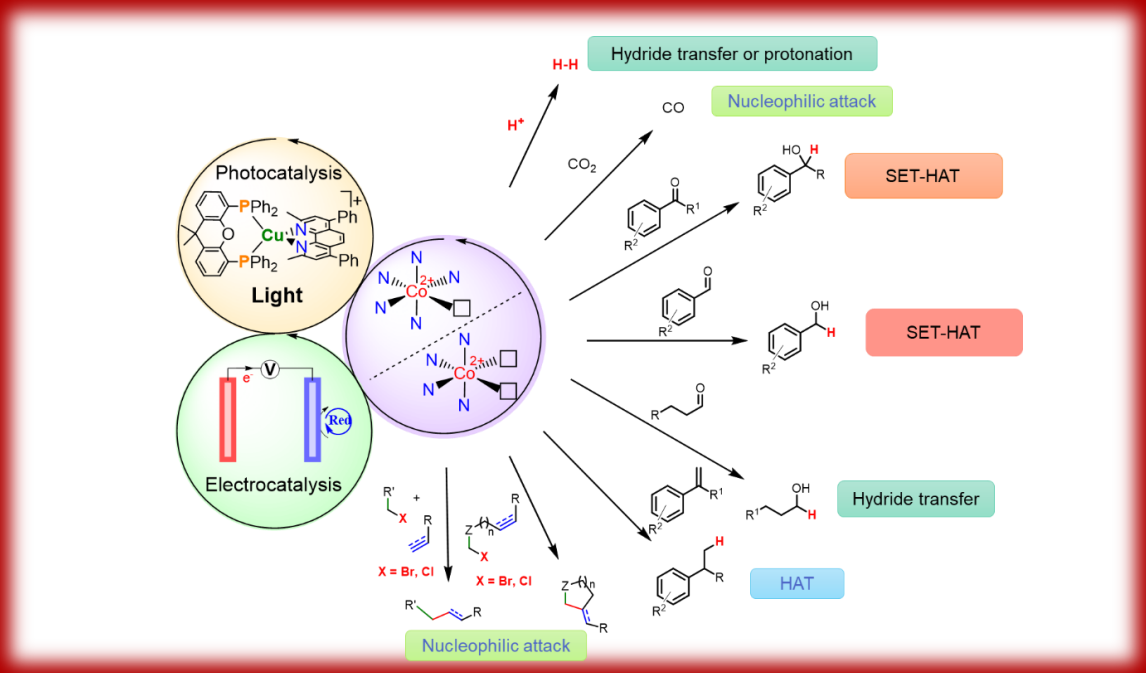
Oxidation and Reduction Chemistry for Artificial Photosynthesis

Giovedì 23 Marzo 2023, ore 15.00
Aula A - Nasini

One of the most appealing research areas is the mechanistic understanding of multi-electron multi-proton processes, which is central to transforming small molecules and artificial photosynthesis. In this line, we will discuss a procedure for the synthesis of water oxidation catalysts, and ideal reaction to extract reductive equivalents. On the reductive site, we have discovered that well-defined coordination complexes based on the tacn moiety are highly efficient homogeneous catalysts for reducing water,[1] CO_2[2] and organic substrates such as ketones, aldehydes and olefines.[3] The low valent metal intermediates also promote the challenging visible-light reductive radical C-C bond formations from unactivated chloroalkanes, which open new avenues in photoredox catalysis.[4]
This presentation will discuss these aspects, and how to control the selectivity between water reduction and the reduction of organic functionalities. Mechanism understanding was employed to develop new reactivity and even unlock the reactivity of the Ir-based photosensitizers.



References
1. A) Call A., et al Chem. Eur. J. 2014, 20, 6171. B) Call A.,et al Chem. Sci. 2018, 9, 2609. C) Call A., et al., ACS Catal. 2019, 9, 5837.
2. A) Fernández S., et al J. Am. Chem. Soc. 2019, 142, 120; B) Fernández S., Cañellas S., Franco F., Luis J. M., Pericàs MÀ, Lloret-Fillol J. ChemElectroChem 2021, 23, 4390.
3. A) Call A., Casadevall, C., Acuña-Pares, F., Casitas Montero, A., Lloret Fillol, J., Chem. Sci. 2017, 8, 4739; B) Call A., Lloret-Fillol J. Chem. Commun. 2018, 69, 9643. Casadevall C., et al Chem. Sci. 2022, 13, 4270.
4. A) Claros M. et al. Angew Chem 2019, 58, 4869 B) Aragon, J. et al. Angew. Chem. 2022, e202114365.

La presenza della S. V. sarà molto gradita.

Prof. Michele Maggini
Direttore del Dipartimento di Scienze Chimiche

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