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Biologically Inspired C-H and C=C Oxidation Catalysts

Miquel Costas

Departament de Química I Institut de Química Computacional I Catàlisi. Facultat de Ciències, Campus de Montilivi, 17071, Girona, Catalonia, Spain.

Miquel.costas@udg.edu

Biologically inspired catalysts are currently explored with the aim to produce selective oxidation reactions. The quest for catalytic methodologies that provide novel reactivities and selectivities that could complement those attained with traditional oxidants, or that could represent a more efficient alternative constitute major reasons of interest for this approach.¹⁻³ Towards this end, iron and manganese coordination complexes ligated to amine and oxygen containing functionalities, and that could be viewed as a minimalistic model of iron coordination sites in non heme iron dependent oxygenases, are employed as catalysts for the oxidation of organic substrates. By control of their structure and electronic properties, catalysts have been designed by our research team that engage in controlled O-O lysis of H₂O₂ to form highly electrophilic high valent metal-oxo species that are finally responsible for enzyme-like selective oxidation chemistry.⁴ Principles of catalyst design and use of these catalysts in selective C-H and C=C oxidation reactions, and reaction intermediates involved in these reactions⁵ will be discussed.

References

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