

Controlling selectivity in alkene oxidation: anion driven *syn*-dihydroxylation or epoxidation catalysed by [Iron(III)(Pyridine-Containing Ligand)] complexes

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The introduction of a pyridine moiety into the skeleton of a polyazamacrocyclic ligand affects both thermodynamic properties and coordination kinetics of the resulting metal complexes.¹ These features have engendered a great interest of the scientific community. Much of the efforts in the use of macrocyclic pyridine containing ligands have been devoted to the study of catalytic oxidation reactions.² We report here the synthesis and characterisation of [Fe(III)Pc-L's] complexes (Pc-L = Pyridine-Containing Ligand) and their catalytic applications in alkene oxidation reactions using H₂O₂ as the terminal oxidant under mild conditions (Figure). Depending on the anion employed for the synthesis of the iron(III) metal complex, we observed a completely reversed selectivity. When X = OTf, a selective *syn*-dihydroxylation reaction was observed. On the other hand, employing X = Cl, we obtained the epoxide as the major product. It should be pointed out that under otherwise identical reaction conditions, using FeCl₃·6H₂O as catalyst in the absence of the ligand, no reaction was observed.

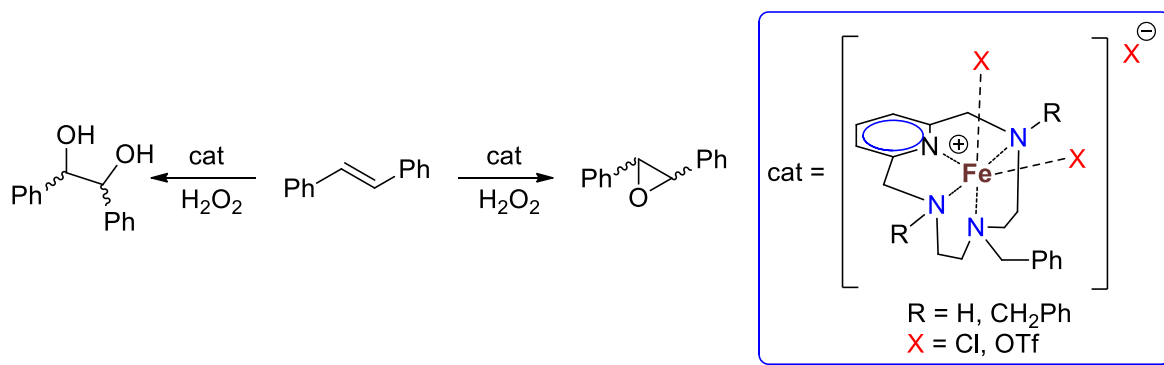


Figure. Selective epoxidation or *syn*-dihydroxylation of alkenes catalysed by [Fe(III)Pc-L's].

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References

1. Tseberlidis, G.; Intriери, D.; Caselli, A. *Eur. J. Inorg. Chem.*, **2017**, 2017, 3589.
2. Serrano-Plana, J.; Aguinaco, A.; Belda, R.; García-España, E.; Basallote, M. G.; Company, A.; Costas, M. *Angew. Chem. Int. Ed.* **2016**, *55*, 6310.