

Lanthanide(III) complexes as efficient homogeneous catalysts for various useful organic reactions

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ABSTRACT

Catalytic reactions reduce energy requirements, and decrease separation costs and efforts due to increased selectivity. From another point of view the field of catalysis is sometimes referred to as a "foundation" pillar of Green Chemistry. Lanthanide(III) ions [Ln^{III}s] and their complexes have found widespread use as mild, stable and selective homogeneous catalysts for multicomponent reactions where both nitrogen and oxygen functionalities are present [1].

Since 2010 our laboratory has been involved in a project aiming at the synthesis, full characterization and catalytic evaluation of Ln(III) complexes with bidentate, tridentate and tetradentate Schiff-base ligands. Among the reaction we have been studying are the Baeyer-Villiger oxidation of ketones (Fig. 1), the aminolysis reactions for the opening of epoxides (Fig. 1), the oxidation of substrates containing double carbon-carbon bonds, and the polymerization of methyl methacrylate and ϵ -caprolactone. The catalytic studies are performed in the specialized laboratories of our collaborators.

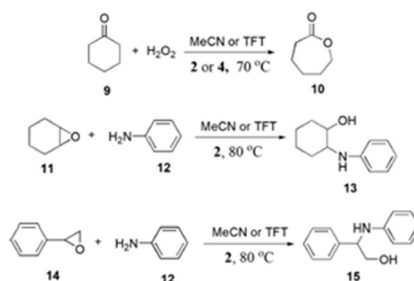


Fig.1 Some of our catalytic transformations studies. Catalysts **2** and **4** are dinuclear Ln(III) complexes containing the monoanion of N-(2-carboxyphenyl)salicylideneimine. TFT= α,α,α -trifluorotoluene.

REFERENCES

[1] G.K. Veits and J. Read de Alaniz. 2012. *Tetrahedron*, **68**:2015-2026.