

University of Salerno



Department of Chemistry and Biology

Ph.D. in Chemistry-XXX course

Thesis on

Calixarene Based Catalytic Systems

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ABSTRACT

Catalysis is the essence of chemistry as it provides useful tools to make and break chemical bonds. As nature has been a guide to many scientists, it's no surprise that in the field of catalysis enzymes were a source of inspiration.¹ Harnessing non covalent interactions, as enzymes do, is a fascinating perspective, and, since supramolecular chemistry became more and more involved in catalysis, a new discipline was born, named supramolecular catalysis.²

Since supramolecular hosts such as calix[n]arenes³ have been fruitfully employed in the synthesis of catalysts,⁴ in these work we report the design, characterization and applications of new calixarene based catalytic systems.

In details chiral calix[4]arene amides **1-7** (figure 1a) were employed as phase-transfer catalysts thanks to their cation complexing properties,⁵ while the calix[4]arene functionalized with a chiral primary amine-thiourea moiety **8** (figure 1b) acted as bifunctional catalyst in several asymmetric conjugate addition reactions.⁶ Finally dinuclear Zirconium-calix[8]arene

complex **9** (figure 1c) proved to be active in the ring opening polymerization of cyclic esters.⁷

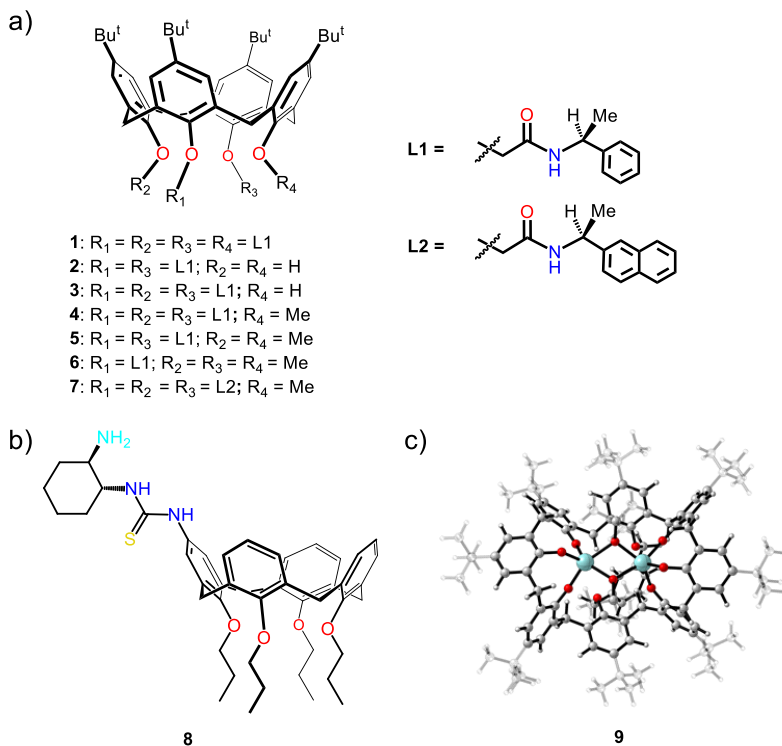


Figure 8. (a) Phase Transfer Catalysts **1-7**. (b) Bifunctional Catalyst **8**. (c) Complex **9**.

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