

Application in asymmetric cyclopropanation of new chiral macrocycles

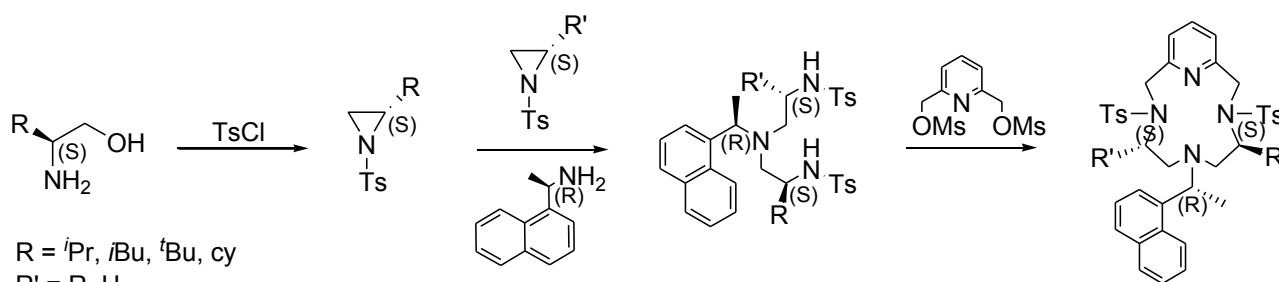
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Our group has been focusing for years on the synthesis and on the study of chiral macrocyclic ligand. Their complexes with metal ions – specially copper(I) and silver(I) – are competent catalysts in various organic reactions.^{1,2,3}

The synthesis of this class of compounds is simple and fast (**scheme 1**). It does not involve either complex procedures nor expensive reagents, since the macrocycles can be obtained from enantiomerically pure and naturally available aminoacids in good yields (overall 40-50%).

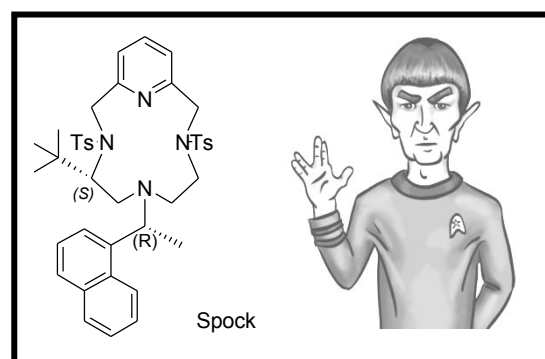


Scheme 1

In this presentation, we reported the synthesis of three new chiral ligands bearing different chiral arms on the macrocyclic backbone.

We also report the studies of complexation of these ligands by Ag(I) and Cu(I) ions and the good applicative results of the latter complexes as catalysts for the cyclopropanation reaction of α -methylstyrene.

The best ligand – friendly called Spock – was used to scope the reaction by employing different substrates, with interesting results in terms of yields and enantioselectivities.



¹ Castano, B.; Guidone, S.; Gallo, E.; Ragaini, F.; Casati, N.; Macchi, P.; Sisti, M.; Caselli, A. *Dalton Trans.* **2013**, 2451-2462

² Castano, B.; Pedrazzini, T.; Sisti, M.; Gallo, E.; Ragaini, F.; Casati, N.; Caselli, A. *Appl. Organometal. Chem.* **2011**, 25, 824-829

³ Dell'Acqua, M.; Castano, B.; Cecchini, C.; Pedrazzini, T.; Pirovano, V.; Rossi, E.; Caselli, A.; Abbiati, G. *J. Org. Chem.* **2014** – epub ahead of print – DOI: 10.1021/jo5002559