Società Chimica Italiana

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

XXXVI Convegno Nazionale della Divisione di Chimica Organica

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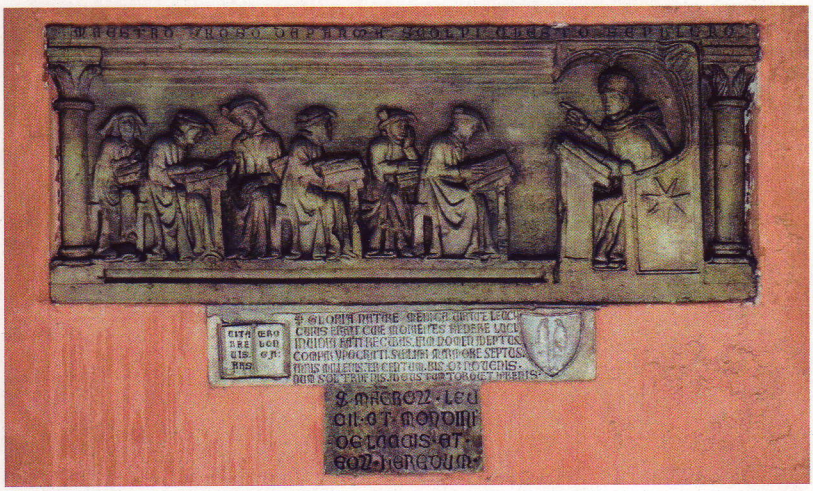
Atti del Convegno



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Task-specific dicationic ionic liquids used as reaction media for Michael addition.

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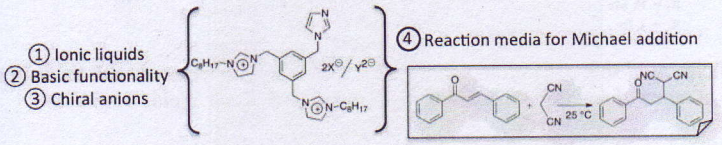
Nowadays one of the main goals in organic chemistry is the research of increasing efficiency in chemical processes taking care of the environmental impact. In this context the choice of the right catalysts and solvents for organic reactions becomes crucial. For this reason in the last decades, ionic liquids have been applied as alternative solvents thanks to their low flammability, vapor pressure and high structural organization.[1] If a catalyst is tethered in the cation or in the anion of the ionic liquids, they are called "task-specific ionic liquids". The ensemble of catalyst and solvent in one compound increases the kinetic mobility and allows a large operational surface area.[2]

We have recently studied the properties and the catalytic ability of novel diimidazolium ionic liquids bearing an imidazole as basic functionality.[3] Properties of these ionic liquids, such as thermal stability, catalytic ability and recyclability are strongly dependent on the nature of the anion used.

With this in mind, we are now interested in the study of Michael addition of malonitrile to *trans*-calchone (Scheme 1), a base catalyzed reaction that leads to a key precursor for the synthesis of some biological and pharmaceutical products. In addition to the basic functionality present on the cationic unit, chiral anions such as tartrate, proline, phenilalanine, (*R*)-(-)-1,1'binaphtyl-2,2'diyl-phosphate, have been used in order to analyze stereochemical aspects of the reaction, studying their effects on reaction time, percentage yields and enantiomeric excess.



Scheme 1 Task-specific ionic liquids used for the study of Michael addition.

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3. a) D'Anna, F.; Gunaratne, N. H. Q.; Lazzara, G.; Noto, R.; Rizzo, C.; Seddon, K. R.; *Org. Biomol. Chem.* **2013**, *11*, 5836. b) Rizzo, C.; D'Anna, F.; Marullo, S.; Noto, R.; *J. Org. Chem.* **2014**, *79*, 8678.