Metal-doped Zeolites as Green Catalysts for Organic Synthesis

Stefan Chassaingc, Aurélien Alixa, Andrea Olmosa, Muriel Kellerb, Jean Sommerr, and Patrick Palea

a Laboratoire de synthèse et réactivité organiques, Institut de Chimie de Strasbourg, Université de Strasbourg, 4 rue Blaise Pascal, 67000 Strasbourg, France
b Laboratoire de physicochimie des hydrocarbures, Institut de Chimie de Strasbourg, Université de Strasbourg, 4 rue Blaise Pascal, 67000 Strasbourg, France
c Laboratoire de synthèse et physicochimie de molécules d’intérêt biologique (UMR 5068 du CNRS), Université Paul Sabatier, 118 route de Narbonne, 31062 Toulouse, Cedex 9, France

Reprint requests to Prof. P. Pale. Fax: (+33) 368 85 1517. E-mail: ppale@unistra.fr

Z. Naturforsch. 2010, 65b, 783 – 790; received March 4, 2010

Dedicated to Professor Willi Kantlehner for his achievements

Metal-doped zeolites prepared by vapor diffusion are excellent heterogeneous catalysts. Copper(I)-exchanged zeolites catalyze for example 1,3-dipolar reactions or Mannich condensation, whereas scandium(III)-exchanged zeolites catalyze the Mukaiyama-type aldolization. These catalysts are easily prepared, stable for months, conveniently recovered by filtration and recyclable. They can be used in safe solvents and even without solvent, and thus fully comply with the Green Chemistry principles. Their ease of handling and their large scope of applications enabled us to introduce the “zeo-click” concept for organic synthesis catalyzed by such green heterogeneous catalysts.

Key words: Heterogeneous Catalysis, Zeolite, Copper, Scandium, Click Chemistry