

# MESOIONIC CARBENES (MICS) BASED METAL COMPLEXES: SYNTHESIS, REACTIVITY AND CATALYTIC APPLICATIONS

G. Guisado-Barrios,<sup>\*a</sup> George. Kleinhans,<sup>b</sup> Daniela I. Bezuidenhout,<sup>b</sup> Eduardo Peris<sup>a</sup> and

Guy Bertrand<sup>c</sup>

<sup>a</sup> Institute of Advance Materials (INAM), Universitat Jaume I, Avenida Vicente Sos Baynat s/n, 12071 Castellon, Spain.

<sup>b</sup> Chemistry Department, University of Pretoria, Private Bag X20, Hatfield 0028, Pretoria, South Africa.

<sup>c</sup> UCSD-CNRS Joint Research Laboratory (UMI 3555), Department of Chemistry and Biochemistry, University of California, San Diego, La Jolla, California 92093-0358, United States.

e-mail: guisado@uji.es

Since the first reported example of metal complexes bearing 1,2,3-triazol-5-ylidene ligands and subsequent isolation,<sup>[1][2]</sup> mesoionic carbene ligands (MICS) have received considerable attention due to their ready availability and the stronger  $\sigma$ -electron donating character when compared to classical NHC.<sup>[3]</sup>

In this contribution, the synthesis, reactivity and catalytic applications of 1,2,3-triazol-5-ylidene based metal complexes will be presented. In particular, a CNC-pincer ligand stands out as a convenient scaffold that allows isolation of very reactive late transition metals complexes.<sup>[4],[5]</sup> and a selective catalysts for one-pot alkyne dimerization-hydrothiolation tandem reactions.<sup>[6],[7]</sup>

- 1) P. Mathew, A. Neels, and M. Albrecht, *J. Am. Chem. Soc.* **2008**, *130*, 13534
- 2) G. Guisado-Barrios, J. Bouffard, B. Donnadieu, and G. Bertrand, *Angew. Chem. Int. Ed.* **2010**, *49*, 4759
- 3) K. F. Donnelly, A. Petroniolo and M. Albrecht, *Chem. Commun.*, **2013**, *49*, 1145
- 4) D. I. Bezuidenhout, G. Kleinhans, G. Guisado-Barrios, D. C. Liles, G. Ung and G. Bertrand, *Chem. Commun.*, **2014**, *50*, 2431
- 5) G. Kleinhans, M. Hansmann, G. Guisado-Barrios, D.C. Liles, G. Bertrand and D. I. Bezuidenhout, *J. Am. Chem. Soc.* **2016**, *138*, 15873
- 6) G. Kleinhans, G. Guisado-Barrios, D. C. Liles, G. Bertrand and, D. Bezuidenhout, *Chem. Commun.*, **2016**, *52*, 3504
- 7) I. Strydom, G. Guisado-Barrios, I. Fernández, D. C. Liles, E. Peris and D. I. Bezuidenhout, *Chem. Eur. J.* **2017**, *23*, 1393