COPPER COMPLEXES BEARING BIS(IMINO)ACENAPHTHENE (BIAN) LIGANDS FOR CATALYSIS

Teresa Avilés[1], Vitor Rosa[1], Christophe Fliedel[1] and Pedro T. Gomes[2]

[1]LAQV, REQUIMTE, Departamento de Química, Faculdade de Ciências e Tecnologia,
Universidade Nova de Lisboa, 2829-516 Caparica, Portugal
[2]Centro de Química Estrutural, Departamento de Engenharia Química, Instituto Superior
Técnico, Universidade Técnica de Lisboa, Av. Rovisco Pais, 1049-001 Lisboa, Portugal
teresa.aviles@fct.unl.pt

The design and synthesis of copper complexes is a subject of current interest since they can be applied in a large variety of metal-mediated transformations, among them and very important applications are the Cu-mediated controlled/"living" radical polymerization, independently reported in 1995 by Matyjaszewski and Sawamoto (1), and the copper(I)-catalysed azide-alkyne cycloaddition reaction (CuAAC) (click chemistry) (2). Elsevier et al. (3) described the synthesis and full characterisation of rigid chelating bidentate ligands of the type Ar-BIAN (bis(aryl-imino)acenaphthene) by condensation of the acenaphthenquinone with 2 equiv of an appropriate aryl-amine. [$CuCl_2$(Ar-BIAN)] are catalysts for the reverse ATRP of styrene and Ar-BIAN-based copper(I) complexes were shown to be active catalysts for the copper(I)-catalysed azide–alkyne. A series of mono- or bis-chelated neutral or cationic (Ar-BIAN)copper(I) complexes have been synthesised and fully characterized. All the complexes adopt distorted tetrahedral geometries around the copper(I) centers. All the complexes are active catalysts for the copper(I)-catalysed azide-alkyne cycloaddition reaction (CuAAC). The bis-chelated complexes are substantially less active than the mono-chelated ones. The Cu(II) [$CuCl_2$(Mes-BIAN)] complex exhibited good activity in the reverse atom transfer radical polymerisation (ATRP) of styrene.

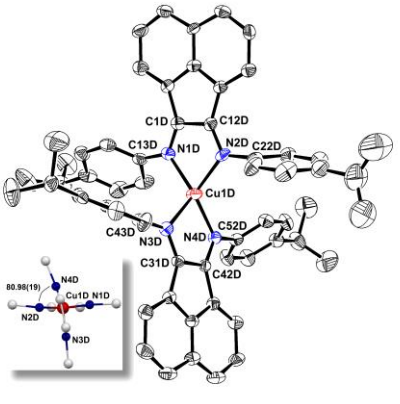

Figure 1: ORTEP diagram of a bischelated Cu(I) complex

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