

Highly Functionalized Brønsted Acidic/Lewis Basic Hybrid Ferrocene ligands: Synthesis and Coordination Chemistry

Léa Radal^a, Petr Vosáhl^b, Julien Roger^a, Hélène Cattey^a, Régine Amardeil^a, Ivana Císařová^b, Petr Štěpnička^b, Jean-Cyrille Hierso^{a,c}, Nadine Pirio^{*a}

^aInstitut de Chimie Moléculaire de l'Université de Bourgogne, Dijon, France

^bDepartment of Inorganic Chemistry, Faculty of Science, Charles University, Prague, Czech Republic

^cInstitut Universitaire de France (IUF)

lea.radal@u-bourgogne.fr

Ferrocenylphosphines are well-known ligands in transition metal catalyzed reactions. The structure and properties of ferrocenylphosphines are advantageous for complexation with different transition metals, and recently cooperative reactivity concepts emerged from ambiphilic ferrocenes use that renews their chemistry.^{1a,b,c} Planar chirality of ferrocene is also one of the interests of these ligands.² In our laboratory, we synthesized polyphosphine that have been used in a variety of catalytic C–C and C–X bond formations.^{3a,b} In our ligands, the conformation of ferrocene platform is controlled by bulky alkyl groups (typically *tert*-butyl) substituting each cyclopentadienyl of ferrocene platform. These two groups influence the ferrocene conformation due to steric hindrance,⁴ and can allow smart control of the mutual function positioning.^{5,6}

A general challenging issue in the synthesis of hemilabile ferrocene ligands is the access to highly functionalized ferrocene starting materials. These can bear donor/acceptor atoms, additional functional and structuring spectator substituents, but the preparation of such species poses general synthetic difficulties. We report herein alternative synthetic routes to hybrid ferrocene donors such as *tert*-butylated phosphanylcarboxylic acids and their corresponding aldehydes.⁷ (**Figure 1**)

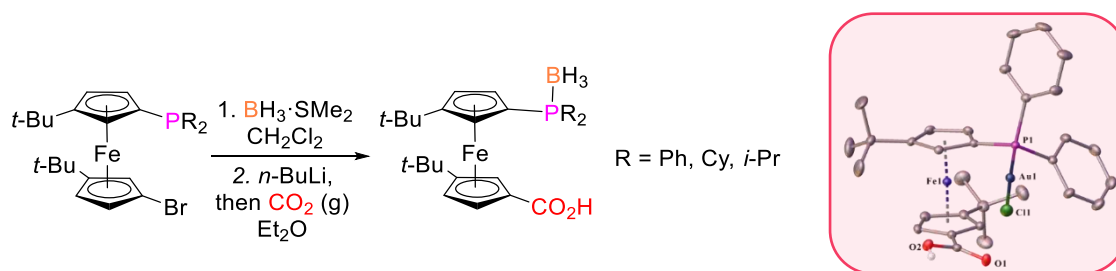


Figure 1 Synthesis of ambiphilic Brønsted acid/Lewis base ferrocenes and coordination chemistry of ferrocenyl hybrids to gold.

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