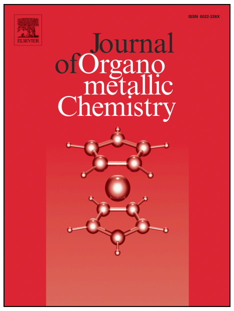
Accepted Manuscript



Synthesis and transition metal chemistry of ferrocenylbis(benzo-oxazaphosphininone)

Pandey Sameer Prasad, Maravanji S. Balakrishna

PII: S0022-328X(18)30167-0

DOI: 10.1016/j.jorganchem.2018.03.009

Reference: JOM 20359

To appear in: *Journal of Organometallic Chemistry*

Received Date: 11 January 2018

Revised Date: 5 March 2018

Accepted Date: 8 March 2018

Please cite this article as: P.S. Prasad, M.S. Balakrishna, Synthesis and transition metal chemistry of ferrocenylbis(benzo-oxazaphosphininone), *Journal of Organometallic Chemistry* (2018), doi: 10.1016/j.jorganchem.2018.03.009.

Synthesis and transition metal chemistry of ferrocenylbis(benzo-oxazaphosphininone)

Pandey Sameer Prasad and Maravanji S. Balakrishna*

Phosphorus Laboratory, Department of Chemistry, Indian Institute of Technology Bombay, Powai, Mumbai 400 076, India.

ABSTRACT: The new ferrocenylbis(oxazaphosphininone), [Fe{$C_5H_4P(OC_6H_4)(CO)N$-($C_2H_4Cl)\}_2$] (**1**) was synthesized by the reaction of bis(dichlorophosphino)ferrocene with two equivalents of 2(2'-hydroxy)phenyloxazoline in the presence of triethylamine in 83% yield. The reactions of **1** with aq. H_2O_2 or elemental sulfur afforded bis-chalcogenides [Fe{$C_5H_4P(E)(OC_6H_4)(CO)N(C_2H_4Cl)\}_2$] (**2** E = O, **3** E = S). Treatment of **1** with [$M(CO)_4(C_5H_{11}N)_2$] (M = Mo, W), [$RuCp(PPh_3)_2Cl$] and [$M(COD)Cl_2$] (M = Pd, Pt) afforded the chelate complexes [Fe{$C_5H_4P(OC_6H_4)(CO)N(C_2H_4Cl)\}_2\{M(CO)_4\}$] (**4** M = Mo, **5** M = W), [Fe{$C_5H_4P(OC_6H_4)(CO)N(C_2H_4Cl)\}_2\{RuCp(Cl)\}$] (**7**) and [Fe{$C_5H_4P(OC_6H_4)$ $(CO)N(C_2H_4Cl)\}_2\{MCl_2\}$] (**8** M = Pd, **9** M = Pt), whereas the reaction of **1** with [Ru(η^6-*p*-cymene)$Cl_2]_2$, yielded a bimetallic complex [Fe{$C_5H_4P(OC_6H_4)(CO)N(C_2H_4Cl)\}_2\{RuCl_2(\eta^6$-*p*-cymene)$\}_2$] (**6**). The reaction between **1** and CuX in equimolar ratio also yielded binuclear complexes, [Fe{$C_5H_4P(OC_6H_4)(CO)N(C_2H_4Cl)\}_2\{CuX\}_2$] (**10** X = Cl, **11** X = Br, **12** X = I). All the compounds are characterized by spectroscopic methods and the structures of complexes **3**, **7**, **9** and **10** were confirmed by single crystal X-ray diffraction studies. The electrochemistry of **1**, **3**, **8**, **9** and **12** is also reported.

Keywords: ferrocene; X-ray structure; dppf; phosphininone; diastereomer

---

∗Author to whom correspondence should be addressed. E-mail: krishna@chem.iitb.ac.in, msb_krishna@iitb.ac.in (M. S. Balakrishna); Fax: +91-22-5172-3480/2576-7152.

1. Introduction

The *1,1'*-bis(phosphino)ferrocene ligands have spotted a continuous growth since the discovery of dppf.[1] Dppf and analogues ferrocenylbisphosphines have been used in several catalytic applications [2-6]; whereas the chiral counterparts have been employed in