

## Abstract

**Title:** Synthesis and properties of a ferrocenyl-substituted diphosphine

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In this work, a new ligand was prepared, namely *N,N*-bis[2-(difenylfosfino)ethyl]amide of ferrocenecarboxylic acid. This ligand was obtained by the reaction of pentafluorophenylferrocenecarboxylate, which was newly synthesized, with the appropriate amine. The ligand was characterized by  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{31}\text{P}$  NMR spectroscopy, elemental analysis, IR spectroscopy and by mass spectrometry. Subsequently, a sulphide was prepared from this diphosphine-amide by the reaction with sulfur in toluene at elevated temperature. The sulphide was characterized in the same manner and also analyzed by single-crystal X-ray diffraction analysis. The coordination properties of the ligand were examined in a reaction with  $[\text{PtCl}_2(\text{cod})]$  (cod = cyclooctadiene) in dichloromethane. The resulting complex was studied by  $^1\text{H}$  NMR, mass spectrometry, elemental analysis and by X-ray structural analysis.

**Keywords:** ferrocene; phosphine ligands; amidophosphines; platinum(II) complexes; crystal structure.