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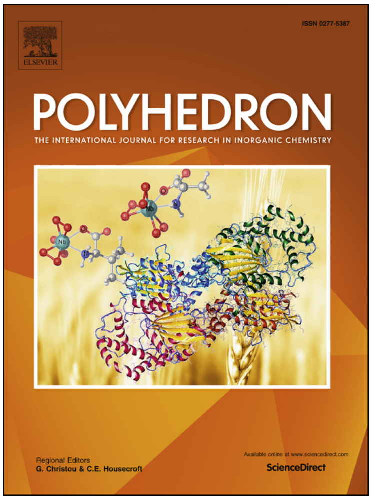

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Synthesis of an Anionic Au(I) Hydroamination Precatalyst Supported by Charged Hydrido-Carboranyl Phosphine Ligands

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Abstract

Herein is reported the synthesis of an anionic gold complex bearing two charged hydrido carboranyl phosphine ligands. The compound is fully characterized by multinuclear NMR spectroscopy, high resolution mass spectrometry, as well as a single crystal X-ray diffraction study. In addition, we probe this compound's ability to catalyze the hydroamination of alkynes and compare its behavior to a related highly active catalyst supported by a perchlorinated carboranyl phosphine.

Keywords: Gold Catalysis; hydroamination; carborane anion; carborane ligand; electrostatic effects

1. Introduction

Neutral phosphine ligands are ubiquitous ancillary ligands in homogenous catalysis. Such species are typically appended with alkyl or aryl groups, to manipulate the steric environment and electronic properties of the metal center. Neutral *closo*-carborane clusters,[1-3] specifically $H_2C_2B_{10}H_{10}$ congeners, are alternative R-groups,[4, 5] which have been heavily investigated over the last 60 years. However, despite these efforts little progress has been made in developing competitive or superior catalysts, compared to classical systems supported by ligands with hydrocarbon R-groups. This fact is perhaps partially explained by the tendency of such clusters to undergo catalyst deactivation by cage degradation[4], B-H cyclometallation[6] reactions, or other

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