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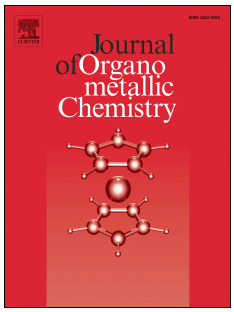

α-Cyanocarbanion complexes and their application in synthesis

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α-Cyanocarbanion Complexes and their Application in Synthesis

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Abstract:

α-Cyanocarbanion complexes feature nitrile ligands containing deprotonated α-carbon atoms. This short review will focus on the various synthetic methods employed to prepare these complexes, the different binding modes they exhibit and their applications to the synthesis of alkylnitriles including β-hydroxy- and β-aminonitriles, the formation of unique coupling products and as key intermediates in the reaction of acrylonitrile with various substrates in hydrophosphination and copolymerisation reactions.

Keywords:

Cyanocarbanion, C–H activation, nitrile, ketenimine, catalysis

1.0 Introduction

α-Cyanocarbanion complexes represent an interesting class of complexes that contain a nitrile ligand featuring a deprotonated α-carbon atom. This is due to the various synthetic methods, bonding modes and applications that have been established in the literature. The first crystal structure of an α-cyanocarbanion complex was reported in 1970.[1] Synthetic applications of these complexes have generally centred on the development of catalysts for the preparation of nitrile-based small molecules.[2] These complexes have also been observed as key intermediates in the reaction of acrylonitrile with various substrates in phosphination, amination and copolymerisation