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SYNTHESIS OF THREE NEW DITERTIARY PHOSPHINES: 1-DIPHENYLPHOSPHINO-2-BIS(*m*-FLUOROPHENYL)PHOSPHINOETHANE, 1-DIPHENYLPHOSPHINO-2-BIS(*p*-FLUOROPHENYL)PHOSPHINOETHANE AND 1-DIPHENYLPHOSPHINO-2-*m*-BIS(TRIFLUOROMETHYL)PHENYL-PHOSPHINOETHANE

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Summary

The syntheses of 1-diphenylphosphino-2-bis(*m*-fluorophenyl)phosphinoethane, 1-diphenylphosphino-2-bis(*p*-fluorophenyl)phosphinoethane and 1-diphenylphosphino-2-*m*-bis(trifluoromethylphenyl)phosphinoethane are reported. They were prepared by base-catalysed addition of >P–H bonds of the diarylphosphines to the C=C double bond of the diphenylvinylphosphine using KOBu^t as a catalyst. The new ditertiaryphosphines thus produced are air-stable crystalline solids, and have been characterised by ^{1}H and ^{31}P NMR spectroscopy.

Introduction

1,2-Bis(diphenylphosphino)ethane has been used extensively as a ligand [1,2]. It forms chelate as well as bridging complexes with transition metals [3]. The complexes formed are sparingly soluble in organic solvents, and so their reactions with other species could not be followed by NMR spectroscopy [1]. In order to improve the solubility characteristics of the transition metal complexes, we have replaced the phenyl groups of one of the phosphorus atoms by *m*- or *p*-fluorophenyl or *m*-trifluoromethylphenyl groups, which would be expected to increase the solubility and also to modify the electronic properties of the phosphorus atom. Unsymmetrical ditertiaryphosphine ligands [4–7] which have chemically and magnetically different phosphorus nuclei attached to the same chelate backbone are important because of the availibility of ^{31}P NMR as a probe for investigation and elucidation of the factors which determine the stereochemistry and reactivity of the resulting transition metal complexes. Another advantage of introducing fluorine groups on *m*- or *p*-positions of the phenyl ring is that this would permit the use of ^{19}F NMR

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