

Tri(3-pyridyl)phosphine as Amphiphilic Ligand in the Rhodium-catalysed Hydroformylation of 1-Hexene

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Z. Naturforsch. **2007**, *62b*, 339 – 345; received November 23, 2006

Dedicated to Prof. Helgard G. Raubenheimer on the occasion of his 65th birthday

The molecular structure of carbonylchlorobis(tri(3-pyridyl)phosphine)rhodium, **1**, has been determined by X-ray diffraction methods. The N-protonated trifluoromethanesulfonate (triflate) complex **3** was synthesised as a model compound for the extraction of a rhodium complex bearing amphiphilic ligands which can allow catalyst recycling in the hydroformylation of alkenes by using their distribution behavior in organic and aqueous solvents of different pH. The high water-solubility of the employed ligand renders the recycling method as only partly successful due to insufficient extraction from the water phase into the organic phase. In the hydroformylation of 1-hexene the production of *n*-heptanal is slightly disfavoured when using the ligand tri(3-pyridyl)phosphine as compared to triphenylphosphine which can be ascribed to a higher amount of ligand-deficient active rhodium complexes of the less basic pyridyl phosphine ligand under CO pressure.

Key words: Pyridylphosphine, Amphiphilic Ligand, Rhodium, Hydroformylation, X-Ray Structure