Rhodium(I) acetylacetonato complexes with functionalized phosphines.

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Rok wydania

1998

Czasopismo

Journal of Organometallic Chemistry

Numer woluminu

570

Strony

63-69

DOI

10.1016/S0022-328X(98)00842-0

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Rhodium(I) complexes $[Rh(acac)(CO)(PR_3)]$ with 1,3,5-triaza-7-phosphatricyclo[3.3.1.1^{3,7}]decane (tpa), tris(2-cyanoethyl)phosphine (cyep), tris(3-sodium sulfonatophenyl)phosphine (tppts), tris(*o*-methoxyphenyl)phosphine (ompp), tris(*p*-methoxyphenyl)phosphine (pmpp), tris(2,4,6-trimethoxyphenyl)phosphine (tmpp), PPh_2(pyl), PPh(pyl)$_2$ and P(pyl)$_3$ (pyl=2-pyridyl) have been synthesized and characterized with ^{1}H- and ^{31}P-NMR and IR spectra. The measured ^{31}P coordination chemical shifts, $\Delta\delta^{31}P\{^1H\}$, correlate well with ν(CO). Differences in ^{1}H chemical shifts of methyl groups of acac ligand, $\Delta\delta_{Me}$, depend both on steric and electronic properties of phosphine ligand. Thus $\Delta\delta_{Me}$ increases with decrease of $\Delta\delta^{31}P\{^1H\}$ and increases with increase of the cone angle of phosphine. Catalytic activity of complexes with tpa, cyep and tppts has been investigated. They are efficient catalysts for hydrogenation of CC and CO bonds, isomerization of alkenes and hydroformylation of alkenes. The mechanism of isomerization of allyl alcohol to propanal has been elucidated.

Słowa kluczowe

Rhodium(I) complexes, Acetylacetonate complexes, Water soluble phosphines, Homogeneous catalysis, Hydrogenation, Hydroformylation

Adres publiczny

https://doi.org/10.1016/S0022-328X(98)00842-0

Strona internetowa wydawcy

http://www.elsevier.com