Rhodium pyrrolylphosphine complexes as highly active and selective catalysts for propene hydroformylation: the effect of water and aldehyde on the reaction regioselectivity.

Autorzy

Ewa Mieczyńska

Ryszard Grzybek

Anna M. Trzeciak

Rok wydania

2018

Czasopismo

ChemCatChem

Numer woluminu

10

Strony

305-310

DOI

10.1002/cctc.201700917

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The hydroformylation of propene catalyzed by $Rh(acac)(CO)_2$ (acac=acetylacetonate) with a 13-fold excess of *N*-pyrrolylphosphine ligands $PPyr_3$, PPh_2Pyr, or $PPh(Pyr)_2$ ($Pyr=NC_4H_4$) was investigated under a pressure of 15 bar (propene/H_2/CO=5:5:5) at 80 °C. The *N*-pyrrolylphosphine ligands facilitated an excellent regioselectivity towards *n*-butanal aldehyde, significantly better than PPh_3 and PCy_3 under the same conditions. In the presence of the strongest π-acceptor, $PPyr_3$, the linear-to-branched aldehyde (l/b) ratio was 8.6, which increased to 27.1 if water was added to the system. The application of a pure aldehyde as a solvent instead of toluene caused a significant increase in the aldehyde yield but with a decreased l/b ratio (2.9–7.6). The regioselectivity parameter l/b increased to 19.3 after the introduction of water as a cosolvent.

Słowa kluczowe

aldehydes, alkenes, hydroformylation, phosphane ligands, rhodium

Adres publiczny

https://doi.org/10.1002/cctc.201700917

Strona internetowa wydawcy

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