Photocatalytic properties of new cyclopentadienyl and indenyl rhodium(I) carbonyl complexes with water-soluble 1,3,5-triaza-7-phosphaadamantane (PTA) and tris(2-cyanoethyl)phosphine.

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Rok wydania

2011

Czasopismo

Journal of Organometallic Chemistry

Numer woluminu

696

Strony

3867-3872

DOI

10.1016/j.jorganchem.2011.08.046

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Reactions of [(η^5-R)Rh(CO)$_2$] (R = cp, ind) with water-soluble phosphines (L = 1,3,5-triaza-7-phosphaadamantane and tris(2-cyanoethyl)phosphine) give the new rhodium(I) complexes of the types [Rh(η^5-cp)(CO)(PTA)] (**1**), [Rh(η^5-cp)(CO)(P(CH$_2$CH$_2$CN)$_3$)] (**2**), [Rh(η^5-ind)(CO)(PTA)] (**3**) and [Rh(η^5-ind)(CO)(P(CH$_2$CH$_2$CN)$_3$)] (**4**) in isolated yields of 52–75%. All these compounds have been fully characterized by IR, ^{1}H, ^{31}P{^{1}H} and ^{13}C{^{1}H} NMR, FAB-MS spectroscopies and elemental analyses. Reactivity for the substitution of phosphine is greater for [(η^5-ind)Rh(CO)(L)] comparing to [(η^5-cp)Rh(CO)(L)] because of a flexibility of the indenyl ligand to undergo facile η^5–η^3 coordinative isomerizations. The obtained complexes are active catalyst precursors for the dehydrogenation of propan-2-ol, octane and cyclooctane under photoassisted conditions without any organic hydrogen transfer acceptors, giving TOFs of 26–56 using **3** as precatalyst.

Słowa kluczowe

atom, Ion, 5-Triaza-7-phosphaadamantane, Tris(2-cyanoethyl)phosphine, Cyclopentadienyl, Indenyl, Rhodium(I), Dehydrogenation

Adres publiczny

https://doi.org/10.1016/j.jorganchem.2011.08.046

Strona internetowa wydawcy

http://www.elsevier.com