



Rh/DNA nanoparticles, synthesis, characterization and catalytic activity in "on water" asymmetric hydroformylation reaction.

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Streszczenie

DNA-stabilized Rh NPs were synthesized by the chemical reduction of $\text{Rh}(\text{acac})(\text{CO})_2$ (acac=acetylacetonate) in water at 80 °C. The obtained nanoparticles, Rh/DNA, were characterized by various spectroscopic and microscopic methods, such as IR, UV-Vis, XRD (X-ray diffraction), ICP-AES (Inductively coupled plasma atomic emission spectroscopy), EDX (Energy-dispersive X-ray spectroscopy analysis), TEM (Transmission electron microscopy), and SEM (Scanning electron microscopy) analyses. Their catalytic activity was successfully investigated in the "on water" hydroformylation of styrene. The conversion of styrene and chemoselectivity towards aldehydes were 100%. A high iso/n ratio was also obtained, up to 6.1 and 16.7 with PPh_3 (triphenylphosphine) and (R)-BINAP (2,2'-bis(diphenylphosphino)-1,1'-binaphthyl) ligands respectively. In the hydroformylation of vinyl acetate with Rh/DNA, performed in the presence of a chiral BINAP ligand "on water", high enantioselectivity was obtained, up to 49% ee. These results were significantly better than when utilizing $\text{Rh}(\text{acac})(\text{CO})_2$ as a catalyst under the same conditions.

Słowa kluczowe

asymmetric hydroformylation, On water reaction, Rh nanoparticles, Rh/DNA, vinyl acetate

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