

Comparison of "on water" and solventless procedures in the rhodium-catalyzed hydroformylation of diolefins, alkynes, and unsaturated alcohols.

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Catalytic systems containing Rh(acac)(CO)₂ or Rh/PAA (PAA = polyacrylic acid) and hydrophobic phosphine (PPh₃) were used in the hydroformylation of diolefins, alkynes, and unsaturated alcohols under solventless and "on water" conditions. The total yield of dialdehydes obtained from 1,5-hexadiene and 1,7-octadiene reached 99%, and regioselectivity towards linear dialdehydes was higher in the "on water" system. The tandem hydroformylation-hydrogenation of phenylacetylene led to the formation of saturated aldehydes (3-phenylpropanal and 2-phenylpropanal) at 98% conversion with a good regioselectivity towards the linear aldehyde in the "on water" reaction. In contrast, solventless conditions appeared better in the hydroformylation of 1-propen-3-ol. 4-Hydroxybutanal, formed in this reaction with an excellent selectivity, was next transformed to tetrahydrofuran-2-ol via a ring-closure process. Cyclic products were also obtained in hydroformylation of 1-buten-3-ol. In reaction of undec-1-ol and 2-allylphenol linear aldehydes were formed with the yield 69–87%. The hydroformylation of 3-buten-1-ol performed under "on water" conditions showed very good regioselectivity towards a linear aldehyde, 5-hydroxypentanal. Further cyclization of the aldehyde to tetrahydropyran-2-ol was observed.

Słowa kluczowe

hydroformylation, On water, rhodium, Solventless

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