Polymerization of phenylacetylene catalysed by RhTp(cod) and RhBp(cod) in ionic liquids: effect of alcohols and of tetraaammonium halides.

Autorzy

Anna M. Trzeciak

Józef J. Ziółkowski

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Streszczenie

RhTp(cod) (**1**) and RhBp(cod) (**2**), almost inactive in CH_2Cl_2, became good catalysts of phenylacetylene polymerization in ionic liquids ([bmim]Cl, [bmim]BF_4: *bmim* = 1-butyl-3-methylimidazolium, [mokt]BF_4: mokt = 1-methyl-3-oktylimidazolium, [bumepy]BF_4: 1-butyl-4-methylpyridinium) and in CH_2Cl_2 in the presence of tetraammonium halides ([R_4N]X, R = Bu, Et; X = Cl, Br). The highest yields of polyphenylacetylene with catalyst **1** were obtained in [bmim]Cl at 65°C (64% after 2 h) and in [mokt]BF_4 at 20°C (56% after 24 h). In alcohols (CH_3OH, $(CH_3)_2CHOH$, $(CH_3)_3COH$) as solvents, up to 100% of the polymer was produced. When a mixture of an ionic liquid and CH_3OH was used as the reaction medium, the polymer yield was similar to the yield achieved in an ionic liquid only, but the molecular weight increased remarkably.Tetraammonium salts, [R_4N]X, are co-catalysts for **1**, and the yield of the polymer increased in the order [Et_4N]Br < [Bu_4N]Br < [Et_4N]Cl < [Bu_4N]Cl. Polymers with molecular weights from 6900 to 38 800 Da were obtained with catalyst **2** in [R_4N]Br or [R_4N]Cl, whereas in ionic liquids ([bmim]Cl, [bmim]BF_4) the corresponding molecular weights were higher, from 51 300 to 60 300 Da.

Adres publiczny

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