



The Heck arylation of mono- and disubstituted olefins catalyzed by palladium supported on alumina-based oxides.

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Palladium catalysts containing Pd(0) or Pd(II) supported on alumina-based mixed oxides prepared by alkoxide sol-gel method (Al_2O_3 , $\text{Al}_2\text{O}_3\text{-ZrO}_2$, $\text{Al}_2\text{O}_3\text{-ZrO}_2\text{-Eu}_2\text{O}_3$, $\text{Al}_2\text{O}_3\text{-MgO}$, $\text{Al}_2\text{O}_3\text{-CeO}_2$, $\text{Al}_2\text{O}_3\text{-Fe}_2\text{O}_3$) are very effective in the Heck coupling of bromobenzene with butyl acrylate in DMF solvent. In the presence of an excess of bromobenzene, butyl cinnamate (1) was formed as the main product after 4 h. With the same catalysts, good results, up to 97% yield of ethyl β -phenylcinnamate (3), were also obtained in the coupling of bromobenzene with ethyl cinnamate. The three most active catalysts, Pd(0)/ Al_2O_3 , Pd(II)/ Al_2O_3 , and Pd(II)/ $\text{Al}_2\text{O}_3\text{-Fe}_2\text{O}_3$, were applied in the Heck cross-coupling of cinnamates with different bromobenzene and iodobenzene derivatives, leading to β -aryl cinnamate products. The highest yield was observed when iodoanisole and cinnamic aldehyde were used as substrates. The formation of Pd(0) nanoparticles in the Heck reaction carried out with supported Pd(II) catalyst precursors was confirmed by TEM measurements.

Słowa kluczowe

Heck reaction, Nanostructured alumina-based oxides, Palladium nanoparticles, Supported palladium, β -Arylcinnamate

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