Oxygen-promoted coupling of arylboronic acids with olefins catalyzed by $[CA]_2[PdX_4]$ complexes without a base.

Autorzy

Ewelina Silarska

Anna M. Trzeciak

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An efficient method was developed for the oxidative Heck reaction between arylboronic acids and olefins catalyzed by anionic palladium complexes of the type $[CA]_x[PdCl_4]$ (x = 1,2) and $[CA]_2[Pd_2Cl_6]$ (CA = imidazolium or pyridinium cation). Molecular oxygen was employed as an environmentally benign oxidant to regenerate Pd(II) species during the reaction. The elaborated protocol could be applied to the coupling of different arylboronic acids with both electron-rich and electron-poor olefins. The catalyst system was further employed for the one-pot oxidative Heck reaction followed by the Heck coupling to build conjugated compounds in good yield.

Mass spectrometry (ESI–MS) and UV–vis spectroscopy was used to identify palladium-containing complexes in the reactions. A plausible reaction mechanism of the oxidative Heck reaction was proposed.

Słowa kluczowe

Oxidative Heck reaction, palladium, ionic liquids, Arylboronic acids, Oxygen

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