

Lewis Acid Enhanced Ethene Dimerization and Alkene Isomerization-ESI-MS Identification of the Catalytically Active Pyridyldimethoxybenzimidazole Nickel(II) Hydride Species

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Abstract

A cationic methallyl 2-pyridine-4,7-dimethoxybenzimidazole (L1) nickel precatalyst is highly selective in ethene dimerizations to 1-butene. The same catalyst isomerizes 1-butene and 1-octene to internal olefins. Co-catalytic additives of B(C₆F₅)₃ or BF₃·OEt₂ coordinate to the catalyst and increase the reaction rates of ethene dimerization. ESI-MS was applied identifying a [L1NiH]⁺ cation as the catalytically active species.