PREPARATION AND APPLICATION OF SUBSTITUTED PHOSPHINES IN HYDROGENATION OF CARBON DIOXIDE

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The utilization of carbon dioxide as benign solvent and chemical reagents is gaining more attention recently [1]. Due to inertness, activation of CO_2 is generally required during the reaction [2-4]. Most of catalysts in the hydrogenation of CO_2 are of phosphine -ruthenium complexes. The phosphine plays a very important role in the catalytic reaction. In this paper, a series of α amine substituted phosphines have been prepared by the reaction of amine with diphenylphosphine and formaldehyde. The catalytic properties of catalyst prepared *in situ* from reaction of $RuCl_3$ with phosphine and $NaBH_4$ are investigated using hydrogenation of carbon dioxide in presence of morphine as a model. The relationship between the catalytic activity and structure of phosphine has been discussed. The phosphine ligand is sensitive to oxygen, and the catalytic activity will be affected strongly by stability of phosphine due to no catalytic species forming from the reaction of its phosphine oxide with Ru complex.

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