Mesoporous Silica-Supported Rh Complexes with Organic Groups for Catalytic 1,4-Addition in Water

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At present, most organic synthesis reactions are carried out in organic solvents which are mainly produced from petroleum feedstocks(1). The use of organic solvents will cause pollution to the environment. On the other hand, water is non-toxic, abundant, cheap and environmentally friendly. The use of water as a reaction solvent not only simplifies the operation of the catalytic organic synthesis but also reduces the environmental harmfulness from the organic solvents.

We previously reported that a mesoporous silica-supported Rh complex catalyst showed high catalytic activity for the 1,4-addition reaction of cyclohexenone with phenylboronic acids in the organic solvent (2, 3).

In this work, we apply this type of catalyst in aqueous system. A mesoporous silica-supported Rh catalyst with organic group was prepared and catalyzed 1,4-addition reaction of cyclohexenone successfully. A high yield of *β*-arylcarbonyl compound (93%) was achieved by mesoporous silica-supported Rh complex catalyst with octyl group as shown in **Figure 1, Scheme 1**. This is because the hydrophobic octyl group protects the active Rh metal center in water.

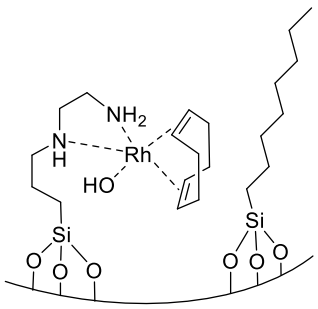
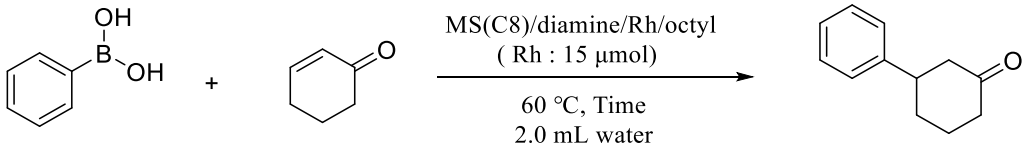


Figure 1. Chemical structure of MS/diamie/Rh/octyl

In the presentation, we will also discuss the effect of immobilized organic group and the pore size of mesoporous silica on the catalytic reaction.



1.5 mmol 1.0 mmol Yield: 93%

Scheme 1. 1,4-addition reaction of cyclohexanone with phenylboronic acids.

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