

PARTIAL HYDROGENATION OF 1,3-CYCLOOCTADIENE CATALYZED BY PALLADIUM COMPLEX CATALYSTS IMMOBILIZED ON SILICA

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We prepared palladium complexes immobilized on silica and applied the resulting catalysts to the partial hydrogenation of 1,3-cyclooctadiene (COD). The preparation of Pd(II)-aminopropylsilane complexes was carried out according to the following three steps: (1) immobilization of aminopropyl ligand on silica surface, (2) complexation of K₂PdCl₄ with aminopropylated silica, and (3) introduction of another ligand such as N,N,N',N'-tetramethylethylenediamine (tmeda). The resulting materials were characterized by ICP-AES, TG/DTA, XPS and IR analyses. When applied to the partial hydrogenation of COD, the prepared catalysts were found to promote the reaction, indicating that the reaction rate was significantly affected by the additional ligand tmeda. On the other hand, the selectivity to cyclooctene at the complete conversion of COD was found to be higher than 99%. However, it was reported that such a high selectivity was hardly achievable with the conventional Pd/C catalyst having the same Pd content, which yielded cyclooctene with a selectivity of about 70%. This indicates the efficiency of silica-supported Pd(II)-aminopropylsilane complex catalysts.