

High-throughput preparation and screening of new heterogeneous catalysts for selective oxidation of propane to acrolein and acrylic acid

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The direct oxidation of propane to acrylic acid has attracted a lot of attention in the past decade in both academia and industry. Until now, three categories of catalyst systems of VPO-type catalysts, heteropoly compounds catalysts and multi-component metal oxides catalysts (MMO) have been studied for the selective oxidation of propane to acrylic acid. MMO catalysts such as Mo-V-Sb-Te (Nb) are commonly considered to have a possibility to substitute the traditional catalysts in the existing industrial two-step process via propylene. However, catalytic performance of these catalysts is not yet sufficient for industrial application. Therefore, the investigation of new catalytic system is necessary to find a more active/or stable catalyst. In the present work, we tried to search a not only optimization of the Mo-V-Te-Nb mixed oxide system but also discovery of new catalytic material for the selective oxidation of propane with using a high-throughput MS screening setup, developed by Maier and co-workers.