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Heteropolyacids show excellent acidic and redox properties and play a very important role as a catalyst even in industrial processes. There are some examples for industrial heteropolyacid catalysts such as an oxidation catalyst of methacrolein to methacrylic acid, a hydration catalyst of light olefins to corresponding alcohols and a polymerisation catalyst of tetrahydrofuran.[1] Mitsubishi Chemical Corporation (MCC) has been focusing on the development of heteropolyacid-based oxidation catalysts of methacrolein to methacrylic acid in a gas phase for several decades. The catalytic reaction is recognised as a part of one of methyl methacrylate (MMA) processes, i.e. C_4 Direct Oxidation (C_4-DO) process starting from isobutylene oxidation. The global production capacity of MMA is ca. 4,500 kte/y and ca. 30% of it is produced by C_4-DO process. At the present time, MCC group occupies ca. 36% of the global capacity and operates MMA business as the leading company.

Our aim is to develop the industrial catalyst for methacrolein oxidation based on Keggin-type PMo heteropolyacid showing high selectivity and extended catalyst life. The development of highly performing catalysts can assure the competitiveness of our C_4-DO MMA process. We have also been underpinning science of heteropolyacid-based compounds from micro to macro structure by using various characterisation techniques.

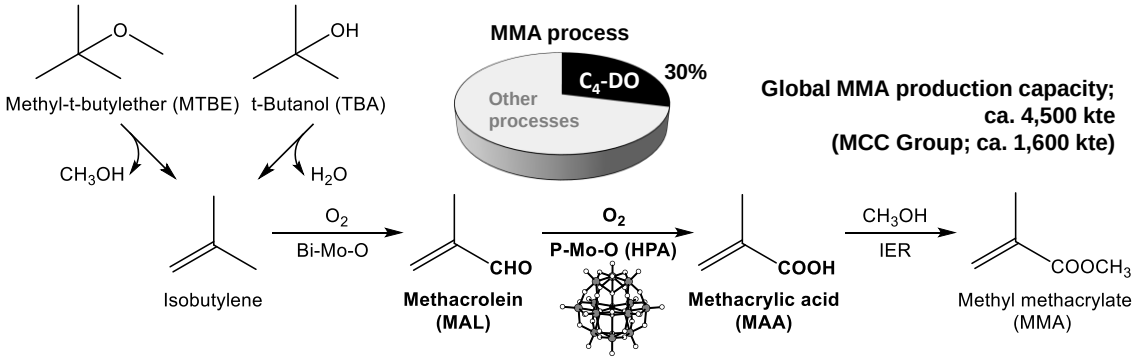

Figure 1 C_4 Direct Oxidation (C_4-DO) process for MMA production and its production capacity

Reference

1. M. Misono and N. Nojiri, *Appl. Catal.* 60 (1990) 1−30