A comparison of zeolite Ti-MWW, Ti-MCM-36 and TS-1 for liquid phase epoxidation of linear alkenes

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Ti-MWW has been prepared by an acid treatment on a boron and titanium-containing lamellar precursor, which is hydrothermally synthesized using piperidine(PI) as a structure-directing agent. Ti-MCM-36 has also been synthesized via swelling and pillaring process using the same lamellar precursor. Ti-MWW, Ti-MCM-36 and TS-1 catalysts have been studied for the epoxidation of alkenes using hydrogen peroxide as an oxidant. Both Ti-MWW and Ti-MCM-36 showed superior activities to TS-1. This result is believed to be a consequence of differences on structures between them; supercages and the exterior 12-membered ring(MR) pockets of MWW structure and 12-MR pockets of high external surface area, which formed mesopore of MCM-36 materials.