

Effect of pH on the physicochemical properties of MoVTeNbO_x catalysts for oxidation of propane to acrylic acid

ABSTRACT

Mo_{1.0}V_{0.3}Te_{0.23}Nb_{0.12} mixed metal oxide catalysts were prepared via slurry method followed by microwave irradiation. The pH (1, 3, 5, and 7) of the synthesis solution was shown to affect physicochemical properties of the catalysts. XRD analysis revealed that the monophasic orthorhombic M1 phase Te₂M₂O₅7 (M = Mo, V, and Nb) was only developed when pH was 1. This catalyst displayed BET surface area, 18.0 m²/g the highest among other samples after post treatment and suggested the elimination of hexagonal M2 phase. The sample was also highly reducible with reduction temperature coincide very well with the temperature of catalytic reaction. Therefore, this catalyst was also active and selective for anaerobic propane oxidation to acrylic acid.

Keyword: Microwave-assisted; MoVTeNbO_x mixed metal oxide; Ph; Post treatment; Propane oxidation