

### Oxidative dehydrogenation of 1-butene to 1,3-butadiene over BiMoFex oxide catalysts with different Fe contents

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Oxidative dehydrogenation (ODH) of 1-butene is an attractive route to the production of 1,3-butadiene for petrochemical and energy industries in order to avoid complete oxidation to CO and CO<sub>2</sub>. Multicomponent bismuth molybdate iron oxide catalysts with different mole ratio of Fe were prepared by a co-precipitation method for use in the oxidative dehydrogenation of 1-butene to 1,3-butadiene. The prepared catalysts were characterized by XRD, Raman spectroscopy, ICP, N<sub>2</sub> sorption, and TPRO to correlate with catalytic activities in the ODH reaction. The catalytic performance of bismuth molybdate iron catalysts depended on iron contents. After reaction for 14 h, the conversion of n-butenes was reached to 69%, selectivity for 1,3-butadiene was 91% and yield of 1,3-butadiene was 62% over BiMoFe<sub>0.65</sub> oxide catalyst and showed the volcano-shaped activity curves with Fe contents. From temperature programmed reduction and oxidation (TPRO) analysis, TPRO peaks area were also maximized at BiMoFe<sub>0.65</sub> oxide catalyst and showed the same trend with catalytic activities.