

## Nanosized zeolite seed-derived Ferrierite for a gas-phase carbonylation of dimethyl ether

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Zeolite is a crystalline inorganic material most widely used as a catalyst in many chemical industries as well as in petroleum industry because of its regular pore structures, acidic natures, and thermal and chemical stability. Among many applications of zeolites, the ferrierite (FER) zeolite can be used for a gas-phase carbonylation reaction of dimethyl ether (DME), which can produce methyl acetate (MA) intermediate for the subsequent production of eco-friendly ethanol. However, the conversion of the carbonylation of DME to MA is generally not high enough. The seed-derived FER synthesized with nanosized FER as a seed, by adjusting the compositions and concentration of seed, contained abundant Bronsted acid sites in 8-membered ring and showed a higher conversion of DME carbonylation with a higher catalytic stability.

Keywords: seed; Ferrierite (FER); dimethyl ether (DME) carbonylation; methyl acetate (MA); coke deposition; deactivation;