Synthesis of the hybrid catalysts with triple oxides for DME SR

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DME SR (Dimethyl ether steam reforming) for H_2 production is generally known to have two reaction steps, hydrolysis of DME to methanol and steam reforming of methanol. The acid sites of catalysts hydrolyze DME into methanol and the copper-based oxides are concerned in the step of the methanol steam reforming. The hybrid catalysts with the triple (Al-Cu-M, M = Zn and Ga) oxides were prepared by one-pot synthesis method with mesoporous silica. The activity for the hybrid catalysts was investigated to the DME SR. The prepared catalysts were characterized with N_2-adsorption/desorption, XRD, NH_3-TPD, SEM and TEM. The hybrid catalysts with the triple oxides showed small crystallite size of metal oxide, mild acidity and high catalytic activity in the DME SR reaction. The increase of the methanol consumption due to the advanced system of triple metal oxides caused the improvement of the activity for DME SR.