

Catalyst design for the oxidative coupling of methane

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The oxidation coupling of methane is a method for suppressing the formation of combustion products including carbon monoxide and carbon dioxide by activating methane molecules under oxidative environment to produce coupled hydrocarbons including ethane, ethylene, propane, and propylene. Numerous catalysts have been suggested for a long period of time, but the reaction characteristics has not been fully understood, and the scaled-up commercialization has not been successful because of the difficult issues of reaction system, separation, and purification. In particular, it is not clear which characteristic of the catalysts secures their activity. In this study, we establish a catalyst design strategy based on which descriptors of catalysts are required for achieving highly active and selective catalysts.