Magnesium Oxide Supported Nickel-Molybdenum Catalyst for Dry Reforming of Methane

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Dry reforming of methane (DRM) has gained attentions due to its viable carbon dioxide recyclability and abundant methane resources. Commodity chemicals heavily produced through DRM, synthesis gas, are also of great interest to chemical industries considering the enormous size of downstream process such as methanol synthesis and Fischer-Tropsch process. However, rapid deactivation through sintering of active metal and coking limits the feasibility of DRM. To meet industrial requirements such as affordability and activity, Nickel has been intensively studied for DRM, which has shown severe coking behavior so far. Here, we design magnesium oxide supported nickel-molybdenum catalyst for high coke durability in DRM. The catalyst show enhanced durability under reactive condition and no clue of coking for 600 hours of reaction, confirmed by Raman spectroscopy, temperature programmed oxidation, and TEM.