

Fischer–Tropsch synthesis on the surface encapsulated mesoporous  $\text{Co}_3\text{O}_4$  by nano ZSM–5

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ZSM–5, one of the microporous solid acid catalysts, has been widely used in petrochemical industry due to its strong acid site and shape selectivity. For Fischer–Tropsch synthesis reaction, ZSM–5 can be used as supporting material or surface membrane for the cracking of heavy hydrocarbons to light hydrocarbons. This method is also beneficial to prevent the catalyst deactivation induced from the surface accumulation of heavy hydrocarbons. We prepared mesoporous  $\text{Co}_3\text{O}_4$  through the nano–replicating method using three dimensional mesoporous KIT–6, and then synthesize the nano–scale ZSM–5 membrane on the as–synthesized mesoporous  $\text{Co}_3\text{O}_4$  by hydrothermal method. The enhanced selectivity in  $\text{C}_2$ – $\text{C}_4$  hydrocarbons by the possible cracking of paraffin wax was observed on the ZSM–5 encapsulated mesoporous  $\text{Co}_3\text{O}_4$ . In order to analyze the surface properties of the catalysts, Scanning Electron Microscopy, Transmission Electron Microscopy, powder X–ray diffraction, Temperature–Programmed Reduction of  $\text{H}_2$ , Temperature–Programmed Desorption of  $\text{NH}_3$  and Brunauer–Emmett–Teller surface analysis were carried out.