

Hydrogenation of CO₂ on iron-based catalysts

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Nowadays, global warming represents significant ecological problem. The crucial aspect is the increasing concentration of greenhouse gases (especially CO₂) in the atmosphere. [1] Possible solution could be assigned to the lowering concentration of CO₂ by conversion into more valuable compounds. [2] For this purposes, iron-based materials demonstrate one of the most effective catalytic material for CO₂ hydrogenation to methane, methanol and another simple hydrocarbons. [3]

This study focuses on catalytic hydrogenation of CO₂ in the gas phase. The reactions proceed at low pressure of 1 bar and the temperature of 325 °C on the catalysts. These catalysts are prepared samples of mesoporous iron oxides with a high surface area. All prepared catalysts are produced CH₄ by conversion unlike the commercial Fe₂O₃ used as reference. By-products of reactions are CO and H₂O. The catalytic activity is different for each sample and relates to a presence of Fe₃C phase in prepared catalysts.

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References

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Figures

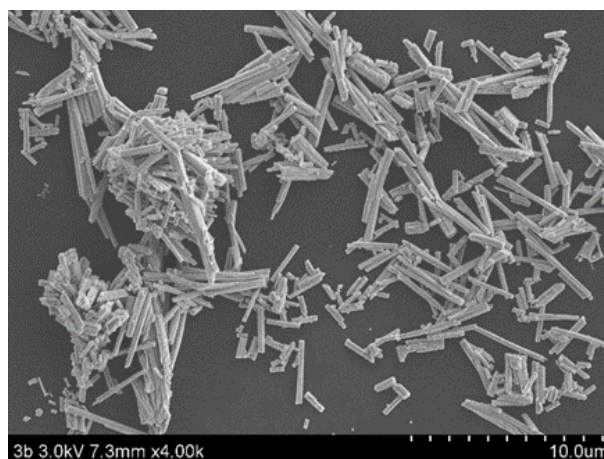


Figure 1: SEM image of catalyst (No. 3) before CO₂ hydrogenation process.



Figure 2: SEM image of catalyst (No. 3) after CO₂ hydrogenation process.