

# Modeling for combined steam and carbon dioxide reforming of methane

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In the present study, synthesis gas was produced from steam-carbon dioxide reforming of methane over alumina supported nickel and chromium catalyst in a fixed bed reactor.

In order to build the model of the process, RSM and ANN method was adopted. The independent variables were feed ratio, flow rate and the reaction temperature while CH<sub>4</sub> conversion, CO<sub>2</sub> conversion and H<sub>2</sub>/CO ratio were set as the dependent variables.

It turned out that ANN methodology was able to describe the reforming process with higher accuracy than RSM because of its training ability. On the other hand, RSM failed to describe the process properly owing to the nonlinearity of the reaction.

Fig.1 Surface plots of the effects of feed ratio, flow rate and temperature on a) CH<sub>4</sub> conversion, b) CO<sub>2</sub> conversion and c) H<sub>2</sub>/CO ratio by RSM.

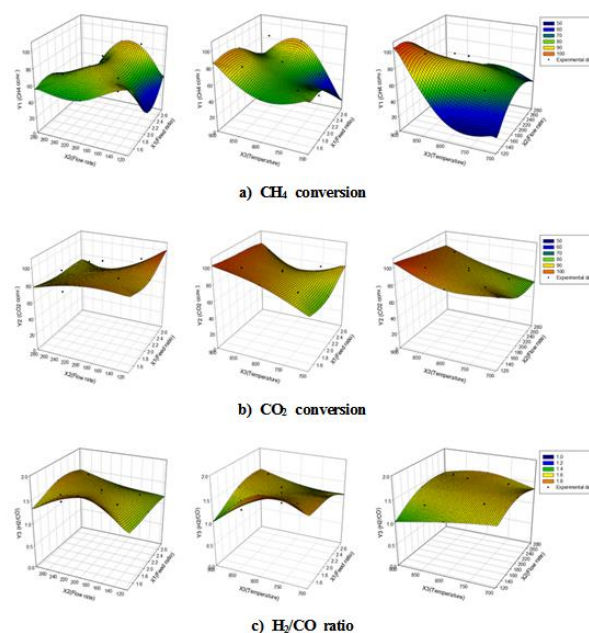


Fig. 2 Surface plots of the effects of feed ratio, flow rate and temperature on a) CH<sub>4</sub> conversion, b) CO<sub>2</sub> conversion and c) H<sub>2</sub>/CO ratio by ANN modeling.

## REFERENCES

