

## عنوان مقاله:

Experimental investigation and development of a support vector machine model for Fischer-Tropsch synthesis in the presence of Co (III)/Al<sub>2</sub>O<sub>3</sub> catalyst

## محل انتشار:

اولین همایش ملی کاتالیستهای صنعتی (سال: 1391)

تعداد صفحات اصل مقاله: 16

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## خلاصه مقاله:

In present paper experimental data obtained from a batch autoclave reactor carrying out a Fischer–Tropsch synthesis in the presence of Co (III)/Al<sub>2</sub>O<sub>3</sub> catalyst was used to develop an artificial intelligence-based kinetics models. Such kinetics models are best suited in cases for which conventional reaction kinetics models cannot be developed/fitted. The model is based on Support Vector Machine (SVM). Model input variables are temperature, pressure and duration of reaction and model output variables are synthesized gas composition that are for CO<sub>2</sub>, CO, CH<sub>4</sub>, and H<sub>2</sub>. Model development that consists of training, optimization and test was performed using randomly selected 80%, 10%, and 10% of the data respectively. Model predictions are in good agreement with experimental data and are compared with those obtained from an ANN-based model that has been developed using the same data set used for development of SVM-based model. Calculated squared correlation coefficients for the molar percentage of CH<sub>4</sub>, CO<sub>2</sub> and CO show that SVM-based model can improve accuracy of predictions by about 26%. Based on the results of this case study SVM proved to be a reliable accurate estimation method that require more attention in the field of chemical engineering.

## کلمات کلیدی:

Catalyst, Fischer-Tropsch synthesis, Support vector machine

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/193710>

