

عنوان مقاله:

Size-dependent Kinetics Determination of MoS₂-K₂O/CNTS Nanocatalyst in the Synthesis of Alcohols from Syngas

محل انتشار:

مجله علوم و فن آوری نفت، دوره 5، شماره 1 (سال: 1394)

تعداد صفحات اصل مقاله: 13

نویسندگان:

Ahmad Tavasoli - University of Tehran

Saba Karimi - University of Tehran

Rohollah Keyaei - University of Tehran

خلاصه مقاله:

The influence of Mo particle size on the catalytic activity and product selectivity of alkalized MoS₂ nanocatalysts has been investigated. Nanocatalysts are prepared using a microemulsion technique with water-to-surfactant ratios of ۱-۱۲. Three different techniques, including XRD, TEM, and hydrogen chemisorption were used to determine the molybdenum average particle size and their activity and selectivity in higher alcohols synthesis (HAS) carried out in a fixed bed microreactor at ۳۳۰ °C and ۷۰ bar. To fix the percentage of CO conversion, the GHSV is changed from ۳.۶ to ۲.۵۷ (nl/(hr.g catalyst)). The average MoS₂ particle sizes are changed from ۴.۵ to ۱۱.۹ nm. The experimental results showed that changing particle size from ۱۱.۹ to ۴.۵ nm decreased the methanol formation rate from ۰.۰۰۶۳۴ to ۰.۰۰۵۳۴ (mol/(hr.g catalyst)) but increased ethanol formation rate from ۰.۰۰۵۸۱ to ۰.۰۰۷۸۷ (mol/(hr.g catalyst)) and higher alcohols formation rate from ۰.۰۰۴۷۳ to ۰.۰۰۶۵۷ (mol/(hr.g catalyst)). A size-dependent kinetics model was developed to calculate the alcohol formation rates versus catalyst average particle size. The model not only matched experimental and theoretical results, but also showed that MoS₂ catalyst had size-dependent structure and for the prediction of product selectivity it was easier to use this mathematical model.

کلمات کلیدی:

Higher Alcohol, Rate, Selectivity, Particle Size, Size-dependent Kinetics

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1858715>

