

Abstract

The role of carbon-containing materials as supports for KCoMoS₂ catalyst on synthesis of alcohols from syngas

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Abstract: Comparison study of the effect of different carbon containing materials used as carriers on transition metal sulfide (TMS) catalyst behavior in the synthesis gas conversion has been conducted. Supports used for the synthesis of alcohols from syngas *via* KCoMoS, in this project are γ -Al₂O₃, Carbon-Coated Alumina (CCA), Graphene coated Alumina (GCA) and different types of commercial activated carbons such as fabric active sorption (TCA), non-woven activated material (AHM), AG-3, and BAW. Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), X-ray Fluorescence (XRF), and N₂ physisorption were used to characterize the carriers and catalysts. The obtained results have shown that GCA is more effective than alumina and CCA to increase the yield ratio between alcohol and hydrocarbons ($Y_{ROH/HCS}$), besides it has shown low selectivity for CO₂. The graphene ribbons have played a role in decreasing the interaction between alumina and active phase which decreased the hydrogenation reaction. The used types of carbon materials showed different supporting efficiency to synthesis alcohol from syngas. The activities depend on the support nature have shown trends to increase in the following order: Al₂O₃ < CCA < BAW < TCA < Ag3 < AHM > GCA.

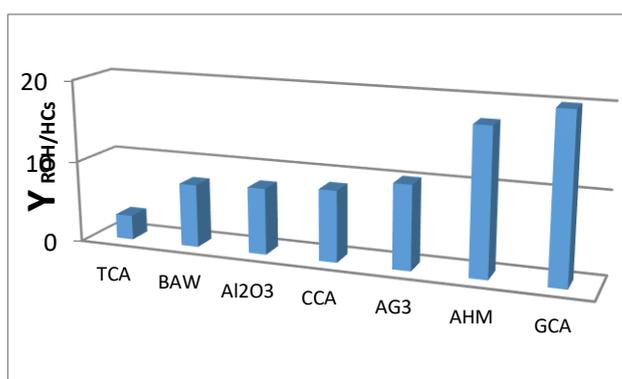


Figure 1. Alcohols hydrocarbons ratio of tested carriers.

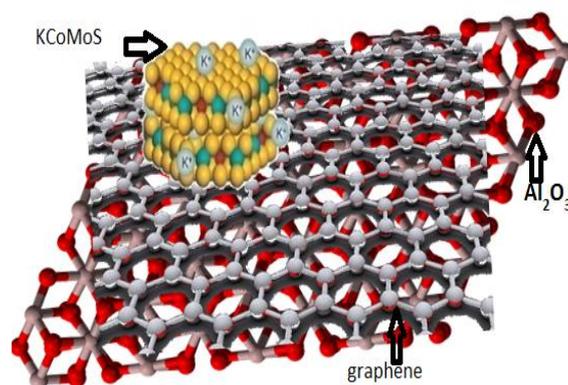


Figure 2. The role of graphene in GCA carrier to conversion of syngas *via* KCoMoS catalyst.

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Conflicts of Interest: Page: 2

The authors declare no conflict of interest.

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