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Title: Catalytic hydrogenation of stearic acid over reduced NiMo catalysts: structure–activity relationship and effect of the hydrogen-donor

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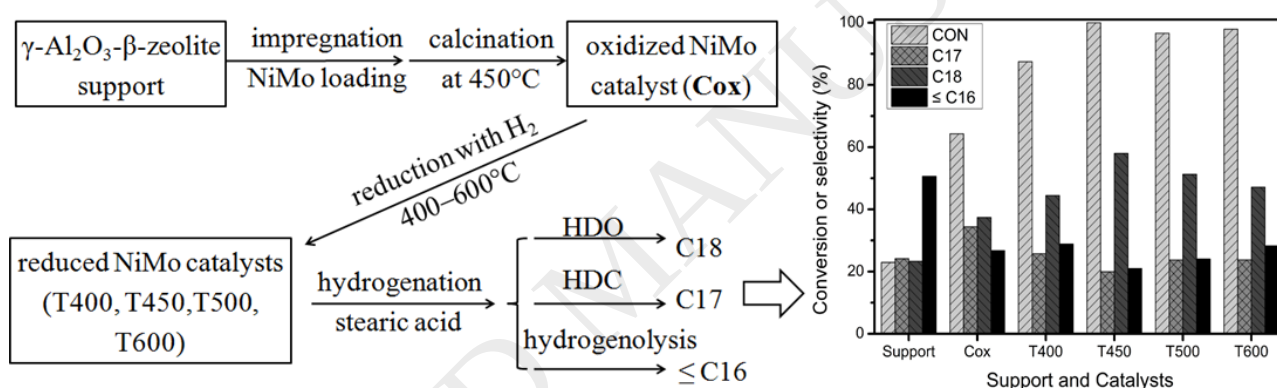
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Graphical Abstract



Highlights

- 1. H₂-reduced NiMo catalyst is used for catalytic hydrogenation of stearic acid.
- 2. Reduction treatment helps produce more reducible metal species in catalyst.
- 3. High H₂ pressure promotes conversion and the formation of C18 hydrocarbons.
- 4. Tetralin exerts different hydrogen-donating effect in H₂ and N₂ atmosphere.

Abstract: Reduced NiMo catalysts were prepared by loading NiMo elements on a γ -Al₂O₃- β -zeolite composite support, followed by reduction with hydrogen at temperatures in the range of 400–600 °C. The hydrogenation activities were investigated through treatment of stearic acid (SA), and were compared with those obtained with the composite support and the oxidized NiMo catalyst (Cox). In the tested reduction temperature range, the catalyst reduced at 450°C (T450) achieved the highest conversion (close to 100%) and C18 hydrocarbon selectivity (58.0%), which were much higher than the results obtained over the composite support and Cox. Reduction treatment contributed to

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