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Crystalline niobia with tailored porosity as support for cobalt catalysts for the Fischer–Tropsch synthesis

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Graphical abstract



Highlights

- Crystallinity, porosity and metal loading of Co/Nb₂O₅ catalysts was studied.
- Nb₂O₅·H₂O mesoporosity was preserved by coverage with sucrose-derived carbon.
- Porous Nb₂O₅ was used as support for cobalt Fischer–Tropsch catalysts.
- Catalysts showed high selectivity, weight- and cobalt-based catalytic activities.

Abstract

Structure and catalytic performance of niobia-supported cobalt catalysts were studied based on crystal phase, porosity and cobalt loading. Crystalline niobia as support proved to be a prerequisite to obtain highly active and selective Co/niobia Fischer–Tropsch catalysts, whereas amorphous niobia showed minimal activity. Crystallization changed the porous morphology of Nb₂O₅·nH₂O resulting in a dense material with low specific pore volume and specific surface area. Multiple impregnations on crystalline Nb₂O₅ were necessary to achieve

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