







Mechanism to H₂ production on rhenium carbide from pyrolysis of coconut shell

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Highlights

- Re₂C was synthesized by mechanochemistry using different Re:C stoichiometries.
- Re₂C was evaluated in H₂ production from coconut shell from 300 to 800°C.
- A mechanism to explain the generation of H₂ from coconut shell was proposed.

Abstract

This paper reports, for the first time, the use of Re₂C as a catalyst for H₂ production from biomass. Re₂C has been synthesized from rhenium and graphite using 1:1 and 2:1 stoichiometries. The highest H₂ productions are obtained at 800°C using 10wt % of Re₂C catalysts. The yield of hydrogen production using Re₂C (1:1) as a catalyst is 53.8%, while with Re₂C (2:1) as a catalyst, it is 57.0%. The yield of 57.0% hydrogen using the Re₂C (2:1) catalyst is the highest reported using biomass. The TPR and FTIR indicate that the Re from the Re₂C is the main catalytic center involved in hydrogen generation from the