

Rapid synthesis of magnetite catalysts incorporated with promoters (Co, Ni, Cu, and Zn) for the HT-WGS reaction over simulated waste-derived synthesis gas

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Magnetite (Fe_3O_4) has been prepared directly to avoid the reduction process prior to the H_2 production from the high temperature water gas shift (HT-WGS) reaction of the simulated waste derived synthesis gas. An amino acid glycine has been employed as a complexing agent as well as a fuel for the auto-combustion process for the direct synthesis of magnetite catalysts incorporated with promoters (Co, Ni, Cu, and Zn). Notably, without the reduction process, the catalyst incorporated with Cu with 5 mole% showed 73% CO conversion at 500°C at a gas hourly space velocity of 48,269h⁻¹.