

The effect of promoters (MgO, CaO, and La₂O₃) on the performance over Ni-Ce_{0.8}Zr_{0.2}O₂ catalysts for low temperature steam reforming of methane

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The promoted Ni-Ce_{0.8}Zr_{0.2}O₂ catalysts have been applied to low temperature steam reforming of methane (SRM) reaction. The metal oxides (La₂O₃, CaO, and MgO) were introduced as a promoter to Ni-Ce_{0.8}Zr_{0.2}O₂ catalysts. Among the prepared catalysts, the Ni-La₂O₃-Ce_{0.8}Zr_{0.2}O₂ catalyst exhibited high activity as well as stability for the SRM reaction, even at a high GHSV of 621,704 h⁻¹. The remarkable catalytic performance of the Ni-La₂O₃-Ce_{0.8}Zr_{0.2}O₂ catalyst is mainly ascribed to the high Ni dispersion and proper interaction between Ni and La₂O₃.