

Abstract

$\text{Ca}_{1-x}\text{La}_x\text{NiAl}_{11}\text{O}_{19-\delta}$ ($0 \leq x \leq 1$) hexaaluminate oxydes were synthesized starting from nitrate salts of Ca, La, Ni and Al precipitated by citric acid. After calcination they were used as catalysts precursors in dry reforming of methane to synthesis gas at atmospheric pressure (600–800 °C) with a mixture of $\text{CH}_4/\text{CO}_2/\text{Ar}:1/1/3$. The solids were characterized by X-ray diffraction (XRD), BET surface area, temperature programmed reaction and oxidation (TPO) and by X-ray photoelectron spectroscopy. XRD analysis shows a pure hexaluminate phase as soon as a part of calcium has been substituted by lanthanum. After H_2 reduction and after reactivity test, Ni metal characterized by XRD is responsible of the high activity (equilibrium conversion near 100% at 800 °C). Ni hexaaluminate shows a remarkable high stability (more than 300 h test) probably due to the low formation of surface carbon (TPO).