Study of LaxNiOy and LaxNiOy/MgAl2O4 catalysts in dry reforming of methane

Authors
Hassiba Messaoudi, Sébastien Thomas, Abdelhamid Djaidja, Samira Slyemi, Akila Barama

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Description
Bulk La_xNiO_y and supported $La_xNiO_y/MgAl_2O_4$ (with x = 1 or 2 and y = 3 or 4) catalysts have been prepared respectively by sol-gel and impregnation methods The elaborated materials have been characterized by XRD, BET, H_2-TPR, H_2-chemisorption and TPO. The catalytic activity was evaluated in dry reforming of methane (DMR) with an equimolar ratio of CH_4 and CO_2. XRD analysis shows the presence of $LaNiO_3$, La_2NiO_4 and $MgAl_2O_4$ phases. Higher specific surface areas and nickel dispersions were obtained for the supported catalysts. H_2-TPR analysis revealed a low reducibility of the nickel in the supported solids. Supported catalysts were found more active and stable than bulk one in DMR in good agreement with higher Ni dispersion and the beneficial role of the basic support. The XRD analysis performed on the spent catalysts (after 65 h of catalytic test) revealed the presence of the initial phases …