

Physico-chemical properties of LaAlO₃ catalysts prepared via Sol–Gel method

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Abstract

Samples prepared by citric acid sol-gel method were subjected to various calcination temperatures in order to investigate their physicochemical properties. The prepared samples were characterized by XRD, TG/DTA, IR, Laser granulometry and cyclic voltammetry. During calcination temperatures, phase evolution were observed. We observed that, the calcination temperature affects significantly the particle size and the catalytic activity of the oxide at higher temperature. The crystallite size result exhibited the same trend with increasing calcination temperature. Similar results were found with LaCoO₃ oxide [1]. Evolution of Oxygen shows that the current density at 950°C is five times lower than 1050°C. This result is in good agreement with those reported by Einaga et al. [2] on the benzene oxidation over LaMO₃ (M =Mn, Co and Al) perovskite catalysts. The catalytic performance of the LaAlO₃ sample is relevant with the crystalline size and the rate of oxygen migration from bulk towards surface [3]. This trend agrees well with the average particle size determined from XRD pattern parameters of the LaAlO₃ oxide. From this study, calcination temperature can be chosen in order to obtain the effective catalyst necessary for the desired catalytic reaction.

Keywords: LaAlO₃, perovskite, Powder diffraction, Thermal Analysis

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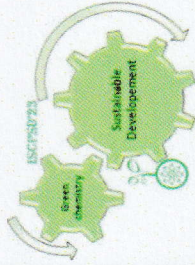
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