

OBJECTIVES

This study was concerned with the synthesis of LaCoO₃ perovskites by the sol-gel related to the Pechini, Schiff base complex and coprecipitation method. Thermal decomposition behaviors were studied by thermogravimetric analysis (TGA) and fourier transform infrared spectroscopy (FTIR). Crystallinity and crystallite size analysis were performed using powder x-ray diffraction (XRD). Elemental analysis was obtained by x-ray fluorescence spectroscopy (XRF). Oxidation states of the samples were investigated using x-ray photoemission spectroscopy (XPS). BET surface areas of the prepared catalysts have been measured by nitrogen adsorption.

Toluene is a model substance to study the activity of prepared catalysts in catalytic oxidation reaction. The reaction and product were analyzed by *in situ* diffuse reflectance infrared fourier transform spectroscopy (*in situ* DRIFTS) and the activity of catalysts was determined in terms of absorbance intensity ratio of unconverted adsorbed toluene at a given reaction time relative to adsorbed toluene at zero time.