

Synthesis of Iron-Based Perovskite Type Catalysts from Rust Wastes as a Source of Iron

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Abstract : For the first time, commercial iron nitrate was replaced by rust wastes, as a source of Iron for the preparation of LaFeO_3 powders by solution combustion synthesis (SCS). A detailed comparison with a reference powder obtained by SCS, starting from a commercial iron nitrate, was also performed. Several techniques such as X-ray diffraction combined with Rietveld refinement, mass plasma atomic emission spectroscopy, nitrogen adsorption measurements, temperature programmed reduction, X-ray photoelectron spectroscopy, Fourier transform analysis and scanning electron microscopy were used for the characterization of the rust wastes as well as of the perovskite powders. The performance of this ecofriendly material was evaluated by testing the activity and selectivity in the propylene oxidation, in order to use it for the benefit of the environment. Characterization and performance results clearly evidenced limitations and peculiarities of this new approach.

Keywords : perovskite type catalysts, solution combustion synthesis, X-ray diffraction, rust wastes

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