World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:12, No:08, 2018

Sonochemically Prepared Non-Noble Metal Oxide Catalysts for Methane Catalytic Combustion

Authors : Przemyslaw J. Jodlowski, Roman J. Jedrzejczyk, Damian K. Chlebda, Anna Dziedzicka, Lukasz Kuterasinski, Anna Gancarczyk, Maciej Sitarz

Abstract : The aim of this study was to obtain highly active catalysts based on non-noble metal oxides supported on zirconia prepared via a sonochemical method. In this study, the influence of the stabilizers addition during the preparation step was checked. The final catalysts were characterized by using such characterization methods as X-ray Diffraction (XRD), nitrogen adsorption, X-ray fluorescence (XRF), scanning electron microscopy (SEM) equipped with energy dispersive X-ray spectrometer (EDS), transmission electron microscopy (TEM) and μRaman. The proposed preparation method allowed to obtain uniformly dispersed metal-oxide nanoparticles at the support's surface. The catalytic activity of prepared catalyst samples was measured in a methane combustion reaction. The activity of the catalysts prepared by the sonochemical method was considerably higher than their counterparts prepared by the incipient wetness method.

Keywords : methane catalytic combustion, nanoparticles, non-noble metals, sonochemistry
Conference Title : ICNNAM 2018 : International Conference on Nanoscience, Nanotechnology and Advanced Materials
Conference Location : Venice, Italy
Conference Dates : August 13-14, 2018