World Academy of Science, Engineering and Technology International Journal of Environmental and Ecological Engineering Vol:9, No:04, 2015

Low-Temperature Catalytic Incineration of Acetone over MnCeOx Catalysts Supported on Mesoporous Aluminosilicate: The Mn-Ce Bimetallic Effect

Authors: Liang-Yi Lin, Hsunling Bai

Abstract : In this work, transition metal (metal= Co, Fe, Ni, Cu, and Mn) modified cerium oxide catalysts supported on mesoporous aluminosilicate particles (Ce/Al-MSPs) were prepared using waste silicate as the precursors through aerosol-assisted flow process, and their catalytic performances were investigated for acetone incineration. Tests on the bimetallic Ce/Al-MSPs and Mn/Al-MSPs and trimetallic Mn-Ce, Fe-Ce, Co-Ce, Ni-Ce, and Cu-Ce/Al-MSPs in the temperature range of 100-300 oC demonstrated that Ce was the main active metal while Mn acted as a suitable promoter in acetone incineration reactions. Among tested catalysts, Mn-Ce/Al-MSPs with a Mn/Ce molar ratio of 2/1 exhibited the highest acetone catalytic activity. Moreover, the synergetic effect was observed for trimetallic Mn-Ce/Al-MSPs on the acetone removal as compared to the bimetallic Ce/Al-MSPs or Mn/Al-MSPs catalysts.

Keywords: acetone, catalytic oxidation, cerium oxide, mesoporous silica

Conference Title: ICEST 2015: International Conference on Environmental Science and Technology

Conference Location : Venice, Italy **Conference Dates :** April 13-14, 2015