

## Low-Temperature Catalytic Incineration of Acetone over MnCeO<sub>x</sub> Catalysts Supported on Mesoporous Aluminosilicate: The Mn-Ce Bimetallic Effect

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**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