Sunil Lonkar et al., J Nanomed Nanotechnol 2014, 5:5
http://dx.doi.org/10.4172/2157-7439.S1.018

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference on
Nanotek & Expo

December 01-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

Nanomet- Hierarchical metal oxide nanostructures for effective mercaptan removal

Sunil Lonkar, Vishnu Pillai, and Ahmed Abdala
The Petroleum Institute, UAE

Metal oxide nanoparticles have always been a material of interest in almost every field due to its unique and vibrant properties. The specific surface area and intrinsic crystallite reactivity are the main parameters deciding its properties and applications. Mercaptans are highly toxic and possess offensive odor, their acidic nature may cause serious corrosion problems. Hence, removal of mercaptans from natural gas is of prime importance. Nanostructured metal oxides can oxidize the mercaptans to form useful metal mercaptides which can be used as hydroprcessing catalyst or as heat stabilizers in the polymer industry. In the present research, the effect of structural hierarchy of nanoparticles towards mercaptan removal from natural gas was explored. The nano-sized metal oxides of Zinc (ZnO), Copper (CuO) and Iron (Fe_2O_3) were synthesized using solvothermal, hydrothermal and microwave methods. The effect synthetic conditions on structure and morphologies of resulting nanostructures were also studied. The characterization includes, X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), Fourier transform infrared spectroscopy (FTIR), Transmission electron microscopy, Thermo gravimetric analysis (TGA) which endowed details such as crystallite size , structure , crystallinity and characteristic functional groups present in the molecules. Finally, the mercaptan adsorption-desorption efficiency of resulting nanohybrids was measured using thermogravimetic analysis. Post adsorption, an effective regeneration of adsorbents can be achieved at moderate temperatures otherwise further reacted to obtain industrially important end products.

slonkar@pi.ac.ae