

Synthesis, Characterization, Thermal and Gas sensing Properties of New Scandium(III) Nano Coordination Polymers

Seyid Javad Musevi^a and Alireza Aslani^b

^aDepartment of Chemistry, Shahid Beheshti Technical Faculty, Technical and Vocational University, Urmia, Islamic Republic of Iran

^bDepartment of Chemistry, Faculty of Science, Ataturk University, 25240-Erzurum, Turkey

* E-mail: a.aslani@sciknow.org

New Scandium(III) coordination polymer at bulk and nanopowders as Scandium 1,4-benzene dicarboxylic acid hydroxide [Sc(OH)(BDCA)]_n, (BDCA = 1,4-Benzene Dicarboxylic Acid) has been synthesized by the reaction of a mixture Sc(III) Nitrate and BDCA in MeOH by simple Branched tube and sonochemical method. The nanopowders of Sc₂O₃ was prepared from the calcinations of the NCP at air atmosphere. The structure of the CP and NCP (CP = Coordination Polymers and NCP = Nano Coordination Polymers) were determined by X-ray crystallography, while nano-structural materials were characterized by X-ray powder diffraction (XRPD), Thermal Gravimetric Analysis (TGA) and Scanning Electron Microscopy (SEM). These NCP and Sc₂O₃ nanostructures have been tested for CO₂ gas monitoring by depositing them as thick films on an interdigitated alumina substrate and evaluating the surface resistance of the deposited layer as a function of operating temperature and CO₂ concentrations. The gas sensitivity tests have demonstrated that the Sc₂O₃ nanopowders, exhibit high sensitivity to CO₂ proving their applicability in gas sensors. The role of the nanopowders on the sensing properties of NCP and Sc₂O₃ are also discussed [1-2].

Keywords: Coordination Polymers, Sc₂O₃, Nanopowders, CO₂, gas sensing.

References

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