Synthesis and Characterization of Copper aerogels

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Metal aerogels are a new class of materials which have unique properties such as porosity, low density, large volume and high surface area. Copper aerogels are a new class of metal aerogels expected to have a high conductivity and activity which can be employed in energy applications. In this research we have successfully synthesized copper aerogels using a one-pot method employing a strong reducing agent ($NaBH_4$) in an ethanol:water mixture. The Copper aerogels formed a network-like porous structure as confirmed by scanning electron microscopy (SEM) studies and exhibit sharp crystalline peaks as confirmed by XRD techniques. Further the aerogels will be characterized by BET, TEM, FTIR techniques for understanding the chemical and physical properties in detail. The electrochemical properties of the aerogels will be analyzed using Cyclic Voltammetry (CV) and Electrochemical Impedance Spectroscopic (EIS) techniques.