Catalytic reduction of 4-Nitrophenol and Dopamine detection using Copper Aerogel

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Metal aerogels are a new class of materials which have unique properties such as high porosity, low density, large volume and high surface area. Copper aerogels are a new class of metal aerogels expected to have high conductivity and good economic feasibility. We successfully synthesized copper aerogels through one-step ethanolic approach. After optimization, we employed various drying techniques, vacuum drying, freeze drying and organic solvent sublimation drying. Physical and morphological characterization (SEM, TEM, BET, XRD, FT-IR, XPS) showed network-like porous structure, sharp crystalline nature and high surface area. Electrochemical characterization (CV, EIS, DPV) showed high current and conductivity. We incorporated copper aerogels into catalytic conversion of p-nitrophenol to p-nitroaniline and modified on GCE for sensing of neurotransmitter-dopamine, and it showed the excellent results.