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Solution Combustion Synthesis of Nickel Oxide and Reduction to Ni Nano Particles for the Synthesis of Graphitic Carbon

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ABSTRACT

Synthesis of nano carbon and it's different form like CNT, graphite, graphene DLC is popular topic of research now a days due to their applications in various field such as catalysis, supercpacitors, gas sensors, bio-sensors etc. For the synthesis of graphite carbon; synthesis of Nickel naoparticles is an important step, which is used as catalyst. So in the present study our efforts were to synthesize NiO nanoparticles using solution combustion synthesis method and its reduction to Ni nanoparticles. NiO particles were prepared by using urea thermal decomposition technique. Aqueous solution of Ni (NO3)2.6H2O and urea with different molar ratio was heated to 400oC temperature gave NiO particles; which when reduced in H2 atmosphere at 600oC temperature for 2 hour produced Ni nano particles. Percentage yield of Ni nanoparticles was 8-10%. Graphitic carbon is synthesized by CVD at 800oC by using oil as precursor and Ni nanoparticle as a catalyst. The surface morphology and nature of graphitic carbon obtained was confirmed by its SEM and XRD study respectively.

Keywords: CVD, Solution combustion, Nickel oxide, Nano particles