

Enhancement on the corrosion properties of Ti-based bulk metallic glass composites by CNT addition

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This study explored the feasibility of preparing $Ti_{50}Cu_{28}Ni_{15}Sn_7$ bulk metallic glass composite with powder metallurgy. With high energy ball milling of a pure Ti, Cu, Ni, Sn and carbon nanotube (CNT) powder mixture, the CNT/ $Ti_{50}Cu_{28}Ni_{15}Sn_7$ metallic glass composite powders can be formed with mechanical alloying (MA) after 8 h milling. The bulk metallic glass composite was successfully prepared by vacuum hot pressing the as-milled CNT/ $Ti_{50}Cu_{28}Ni_{15}Sn_7$ metallic glass composite powders. The corrosion behavior of the $Ti_{50}Cu_{28}Ni_{15}Sn_7$ bulk metallic glass as well as composites modified by the addition of CNT was investigated by electrochemical measurements. Electrochemical characterization was performed in Hanks' solution at 37°C with physiologically relevant dissolved oxygen content. The potentiodynamic polarization measurements on the Ti-based bulk metallic glass composites showed spontaneously passivity was formed by anodic polarization with a passive current density of about 10^{-5} A/cm². The higher corrosion resistance of the Ti-based bulk metallic glass composites was attributed to stable and protective passive films enriched with titanium containing certain amounts of additional elements.

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Effect of organic (R6G) dye on structural and optical properties of pure KDP crystals

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The doping effect of organic dye on the structural and optical properties of KDP single crystals has been reported in this paper. Bulk concentration 1.0 mol%, 2.5 mol % & 5 mol % of R6G dye were doped in KDP single crystals by using slow evaporation solution technique. Powder X-ray diffraction (XRD) studies were carried to confirm the crystal structure and lattice parameters. X-ray study reveals that the structures of the doped crystals are slightly distorted compared to the pure KDP crystal. The respective values of structure related parameters like crystalline size, strain, etc. have been calculated using powder x-ray diffraction result. The optical properties of the grown crystals have been investigated by using UV-VISIBLE Spectra. The band gap energy for the doped KDP crystals was calculated from optical transmission spectrum.

Biography

Preeti Singh is pursuing Ph.D. degree from Jamia Millia Islamia, India. She completed M.Sc. physics in the year 2006-08 from the same university. She has five publications in journal and one publication in *Macmillan Advanced Research Series*.

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Synthesis of boron carbide nanoparticles by solvo-thermal synthesis route

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The present work describes a new method for the synthesis of boron carbide nano particles. It is one step synthesis route. High purity B_4C nano particles are synthesized by this route. The effect of synthesis parameters (temperature, time and composition) is also studied. The synthesized particles are analysed using scanning electron microscope (SEM), and x-ray diffraction (XRD). The microstructural examination showed that the particles are spherical in shape. The average size of the particles is about 15 to 20 nm. This method can be used for the mass production of B_4C nano particles.

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