J Material Sci Eng 2017, 6:2 (Suppl)
http://dx.doi.org/10.4172/2169-0022.C1.062

Highly porous permeable cellular materials of the corundum ceramics

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Porous materials are commonly used as catalyst supports in the processes of oxidation, hydrogenation and dehydrogenation at high temperature, corrosion in feed processing corrosive environments at endothermic and exothermic reactions. In particular, for this purpose, various types of corundum materials with high chemical inertness were used. Materials due to the high porosity and peculiar structure have specific properties dramatically different from those of the corresponding chemical composition of dense materials. There was obtained a highly porous cellular material of alumina carriers for catalysts. The filler used to be electro corundum as reinforcing filler, forming on fire a bundle of used porcelain. The samples were prepared by impregnating the ceramic slurry polyurethane foam (PUF), followed by drying and calcining at 1450 °C. The porosity after exposing to fire was 60-65% and compressive strength of 3.5 MPa.

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Synthesis of glutathione-L-cysteine co-capped CdTe core shell system and its antioxidants properties

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This paper explains a one-pot green synthesis of type II water soluble glutathione-L-cystein co-capped CdTe core and CdTe/CdSe core shell QDs using cadmium acetate, potassium tellurite (K_2TeO_3), sodium borohydride ($NaBH_4$), glutathione and L-cystein as the starting material. The reaction was carried out in a single three-necked flask open to the atmosphere under reflux at 100°C. Their optical properties were characterized by UV-vis absorption spectroscopy and florescence spectroscopy, while their structure and morphology were characterized by transmission electron microscope (TEM), Fourier Transform Infra-Red Spectra (FT-IR) and X-Ray Powder Diffraction (XRD). The effects of different reaction times, pH and mole ratios were varied to determine optimum conditions for synthesis. Compared to CdTe core (564 nm), the core shell (600 nm) demonstrated a drastic shift in wavelength to the red region proving that as extra material had been deposited unto the surface of the core. The 20, 40 and 60 days stability tests conducted proved that core-shell nanoparticles were quite stable compared to the core material. Investigation was also conducted on the total anti-oxidant capacity (TAC) of the material and the results demonstrated some level of significance at 24 and 72 hours of termination as against the control. The statistical analysis showed that little damage was done to the antioxidant defenses in some certain organs of the mice and this shows that the synthesized material has some degree of low cytotoxicity. Since this reaction did not involve the use of a nitrogen atmosphere nor special ligand or buffer solutions; it suggests that the process could be easily operated on an industrial scale and 1 hour is almost the same showing that the QDs are well formed.

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