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**HYDROTHERMAL SYNTHESIS OF HYDROXYAPATITE
NANOPOWDERS**

A PROJECT REPORT PRESENTED BY

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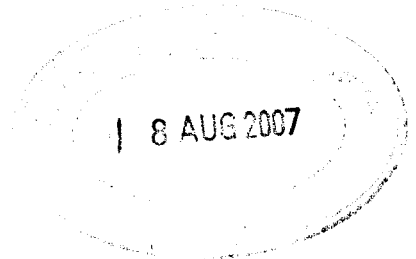
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HYDROTHERMAL SYNTHESIS OF HYDROXYAPATITE NANOPOWDERS

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Nanoscience and nanotechnology have become a promising popular area of investigation pursued almost all over the world. In this context nano-materials are extensively investigated, as they possess novel properties with potential practical applications. Very large surface to bulk ratio of nano-materials make them behave very differently from macro-particles. Quantum confinement effects in semiconductor nano-particles, their application in lasers and photon detection are well known. Another important property of nano-particles happens to be their catalytic activity, again result of large surface area for a given weight. Nano-particles of non-toxic inorganic materials also have important properties finding applications. Water purification is one such area and the other is medical applications.

Apatite is a non-toxic inorganic compound widely distributed in nature as a mineral and a natural material of living organisms. Mineral apatite is always macro-crystalline, whereas in human teeth, apatite occurs in the nanocrystalline form. Development of techniques for preparation of apatite nano-particles is quite important for bone grafting, metal implantation in bone and as component for dental fillings. In this work nanocrystals of hydroxyapatite was prepared by a hydrothermal method using calcium chloride and sodium dihydrogen phosphate as precursors. Cetyl trimethyl ammonium bromide was used as a crystal growth inhibitor. The product was characterized by XRD, SEM, UV-Visible and FTIR techniques. Results confirm that the technique adopted enables preparation of hydroxyapatite nanoparticles having dimensions of the order 10 nm.