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Implantable magnetic-dielctric composites for prolonged hyperthermia treatment of hepatic lesions

Alok Srivastava[a], **Somesh Mohapatra**[b] and **KL Yadav**[c]
[a]Department of Physics, DAV (PG) College, India
[b]Metallurgical and Materials Engineering Department, Indian Institute of Technology, India
[c]Smart Materials Research Laboratory, Indian Institute of Technology, India

The low rates of success of surgical resection and side effects of chemotherapy used in the treatment of hepatocellular carcinoma have elicited substantial research interest in alternative methods for treatment. Here we report the use of magnetic-dielectric composite of Chromium doped Iron Oxide ($Cr_{0.2}Fe_{1.8}O_3$) – Polyvinylidene Fluoride (PVDF) for the hyperthermia treatment of hepatic lesions. The magnetic oxide was prepared by sol-gel processing route and characterized by X-Ray Diffraction method and Room Temperature Vibrating Sample Magnetometry (VSM). The composite was formed in Acetic Acid media where the magnetic oxide was embedded in the PVDF matrix. Thermal property characterization was done by Differential Thermogravimetric Analysis – Differential Scanning Calorimetry (DTA-DSC). Further, surface morphology was studied using Scanning Electron Microscopy and biocompatibility was ensured by MTT-Assay and Cellular uptake studies.

In silico studies were carried out using Finite Element Method simulation.

Biography

Alok Srivastava is teaching in Dayanand Anglo Vedic Post Graduate College, Dehradun –India since last 20 years. His specialization is in Ceramic Composite Materials in Solid State Physics. He is working with scientists of one of the top Technological Institutes of India that is IIT Roorkee. He has published a number of research papers on temperature stable ceramic composites. Currently he is working on latest Bio-Materials.His latest research paper is on “Implantable magnetic-dielectric composites for prolonged hyperthermia treatment of hepatic lesions”

shriv.alok@gmail.com

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