NATIONAL CONFERENCE ON SMART MATERIALS
NCSM - 2016

23rd & 24th February 2016

Proceedings

Organized by

PG & RESEARCH DEPARTMENTS OF PHYSICS & CHEMISTRY

Lady Doak College, Madurai

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

"College with Potential for Excellence"

Re-accredited by NAAC with 'A' Grade

3rd cycle : CGPA 3.44 on a 4 point scale

ISBN 978-81-900971-9-2

Published by
Departments of Chemistry and Physics
Lady Doak College, Madurai-625 002

Printed by
El-Shaddai Printers
Madurai

INVESTIGATIONS ON SPIONS AS EXOGENEOUS CONTRAST AGENTS FOR IMAGING APPLICATIONS

M.Ragam, S. Sivssubramanian*, S. Vincent* and N. Sankar**

Assistant Professor, Department of Physics, Fatima College, Madurai
**Associate Professor, Department of Advanced Zoology and Biotechnology, Loyola College, Chennai*
***Associate Professor, Department of Physics, Yadava College, Madurai*
Email: mraagam.physics@gmail.com

ABSTRACT

Photoacoustic Imaging (PAI) technique is a promising biomedical imaging technique that utilizes ultrasonic signals that capture information about optical absorption property relevant to physiology and pathology inside tissues. Exogenous contrast agents greatly enhance the imaging contrast and potentially breakthrough the imaging depth limit. Also, these agents could be used for therapy in conjugation with drugs where it functions as an enhancer for the integration of diagnosis and therapy. In this article, we present super paramagnetic iron oxide nanostructures (SPIONs) as exogenous contrast agents for photo acoustic imaging. Also, structural, optical, magnetic properties of synthesized SPIONs are analysed.

Keywords: photoacoustic imaging, molecular imaging, contrast agents, SPIONs

INTRODUCTION

Photoacoustic Imaging (PAI) is one of the emerging biomedical techniques that utilize ultrasonic signals as an information carrier. Unique advantage of PAI is their ability to provide high resolution functional information such as hemoglobin, blood oxygenation and properties relevant to physiology and pathology [1-3]. The basic process of PAI is summarized as: (i) the tissue absorbs light energy after being irradiated by visible signals (ii) the absorber produces adiabatic expansion that induces photoacoustic signals (iii) the transducers detect the signals (iv) a data acquisition system stores up information for image reconstruction analysis. PAI has a high