

# **THE UTILITY OF MAGNETIC IRON OXIDE NANOPARTICLES STABILIZED BY CARRIER OILS IN REMOVAL OF HEAVY METALS FROM WASTE WATER**

**K. L. PALANISAMY<sup>1</sup>, V. DEVABHARATHI<sup>2</sup> & N. MEENAKSHI SUNDARAM<sup>3</sup>**

<sup>1</sup>Department of Physics, Sengunthar Engineering College, Tiruchengode, Tamil Nadu, India

<sup>2</sup>Department of Physics, KSR Institute for Engineering and Technology, Tiruchengode, Tamil Nadu, India

<sup>3</sup>Department of Biomedical Engineering, PSG College of Technology, Coimbatore, Tamil Nadu, India

## **ABSTRACT**

The significance of nanoparticles for various applications is often assessed by their narrow size distribution, suitable magnetic saturation, better biocompatibility and low toxicity effects. In this work superparamagnetic iron oxide nanoparticles (SPIONs) were synthesized via a co-precipitation technique using ferrous salts with a Fe<sup>3+</sup>/Fe<sup>2+</sup>. Carrier oils such as olive oil, and flaxseed oil have been used as the coating material, owing to their benefits to the environment. This paper is concerned with the removing a heavy metal, copper, nickel and chromium, from its aqueous solution by carrier oils mediated iron oxide nanoparticles filtration. The prepared nanoparticles were studied in terms of size, morphology, magnetic behavior, structure, surface area including surface chemical structure and charges using different techniques such as XRD, FTIR and TEM.

**KEYWORDS:** SPIONs, Olive Oil, Flaxseed Oil and Water Treatment