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## Iron oxide/phthalocyanine composites for electrochemical detection of heavy metals

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Electrochemistry has been widely recognized as a simple and yet highly efficient method for the fabrication of low cost, portable sensors for onsite detection of heavy metals. This study explores the use of iron oxide nanoparticles incorporated with metallophthalocyanines for the selective detection of heavy metal ions from aqueous solution. The iron oxide nanoparticles (NPs, Fig 1a) were synthesized using a co-precipitation method and later coated with silica via a modified Stober method. The synthesized nanoparticles were characterized using IR, EDX, SEM, TEM, XRD, XPS and Mossbauer spectroscopy. These characterization techniques confirmed NP formation, silica coating and super paramagnetism. Phthalocyanines have been reported to enhance electrochemical sensitivity of numerous electrochemical reactions due to their extensive  $\pi$ -system. The Pcs were synthesized and characterized using IR, UV-vis, MCD and MALDI-TOF. It is expected that the impressive properties of iron oxide nanoparticles coupled with the electro-active Pcs will have a synergistic effect that will enhance the sensitivity of heavy metal detection. The electrochemical performance of this hybrid system towards the selective detection of heavy metals is explored.

### Biography

Ms. Denisha Gounden has completed her undergraduate (BSc. Biochemistry, Chemistry) and honors (BSc. (Hons) Chemistry) degrees at the University of KwaZulu-Natal (2010-2014). She is currently pursuing her MSc. degree. Her first scientific paper was published in 2015, which was based upon her honors research entitled, the "Impact of spiked concentrations of Cd, Pb, As and Zn in growth medium on elemental uptake of *Nasturtium officinale* (Watercress)".

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