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Synthesis of iron oxide nanoparticles by green chemistry using *Cymbopogon* extract for antibacterial and eco-toxicity evaluations

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In the last few years, nanotechnology has been the focus of many investigations due to their nanoscale typical properties with a wide range of applications in the electrical, biomedical, biological, chemical and pharmaceutical fields. It has found that iron oxide nanoparticles have a great interest owing to its important role in technological application and, especially has established a promising in the biological and biomedical fields. These nanoparticles have unique physicochemical properties and capabilities allowing the cellular and molecular interactions within the living organisms and ecosystems, and in this context, some studies may be considered regarding the evaluation of toxic effects that can be led with the use of iron oxide nanoparticles. Taking into account the current and wide applications of these nanoparticles, methodologies of synthesis such as co-precipitation, thermal decomposition, hydrothermal, among others, have developed concerns about the impacts produced to the environment and the high consumption of energy, reactants, and other resources. Therefore, a green synthesis for nanomaterials preparation has emerged in order to obtain the same products with an eco-friendly and safe process route, in which natural resources and wastes have been used for this purpose. Herein, we present a green chemistry approach for iron oxides nanoparticles synthesis using *Cymbopogon* aqueous extract as a reducing agent. The synthesized nanoparticles were characterized using XPS, TEM, VSM, IR, TGA and XRD analysis. Besides, the iron oxide nanoparticles properties were evaluated through antibacterial and eco-toxicity tests, using *E. coli* and *C. elegans* respectively.

Biography

David Patino Ruiz is a chemical engineer and doctoral candidate in engineering with emphasis in Science and Technology of Materials at Universidad de Cartagena. The research has been focused on synthesis, characterization, and application of nanomaterials for different fields in which include water and soil treatments, drug load and delivery, among others. He has made oral presentations in different conferences with nanotechnology approaches and has made research exchanges at Cornell University with the collaboration of doctoral students in order to increase his knowledge in nanomaterials with highly desired characteristics for different purposes.

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