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Characterization and fundamental studies of zero valent iron nanoparticle (nZVIP) by using single particle detection methods

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During the last decades, single particle detection have opened a novel sight for doing electrochemistry. The possibility of detecting single biomolecules, differentiate between a single cancer cell in presence of healthy cells and detecting single viruses are envisioning steps toward the development of biosensor and novel techniques for better understanding of a human's machinery. More recently, advances in single metal detection of nanoparticles, organic particles and oxide particles have been achieved. Studies in non-homogeneous solutions detecting an emulsion oil droplet has been accomplished. In this research, zero valent iron nanoparticles (nZVI) prompt to oxidation in aqueous media, are detected and characterized by electrochemical techniques using the emulsion droplet single particle approach. During the experiment, it is expected to observe current blips as a result of a current increase when the electroactive modified drop reaches the electrode. ZVI particles are known to be ion sequesters and are used for environmental remediation. Due to this behavior, the nZVI particles are a promising alternative to heavy metal poisoning. Because cancer cells are known to have a higher iron requirement than healthy cells, this fundamental research elucidates how an iron-based cancer biosensor would work. Emulsion oil droplet experiment results can be used to forecast the cell behavior in presence of nZVI. Applications for fundamentally drifted experiments aim to elucidate and characterize novel nanomaterials that are currently used.

Biography

Annelis O Sánchez has completed her Baccalaureate degree at University of Puerto Rico- Rio Piedras Campus and is currently pursuing her PhD candidate at same institution. She had worked as a Chemist in several pharmaceuticals, and private companies. She has experience as a Chemist in a variety of interdisciplinary areas such as "Clinical, environmental, pedagogy and industrial". She completed her internship at University of Texas in Austin, where she learned the basis of single particle detection methods.

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