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Carbon based microbial system for ureolysis of wastewater

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Scarcity of clean water is a common problem in many parts of the world. For this reason, water recovery from waste water is essential in the modern world. Major source of nutrients in waste water is urine, approximate 80% of nitrogen, 50% of phosphorus and 9% of the potassium. One of the limitations of reusing wastewater is the presence of urea. The removal of urea is difficult because its small size and lack of charge does not allow the use of common methodologies. This work presents an innovative technique that integrates the use of a carbon anode and a urease positive bacteria, *Proteus vulgaris*, for the removal of urea. The carbon electrode was modified with platinum nanoparticles for the oxidation of ammonia produced by the bacteria. The modification of the carbon electrode was done by immersion varying the exposition time in the ink and the way the electrode was dried. Cyclic voltammetry was done to characterize the platinum particles and the carbon electrode before and after the modification. SEM images were taken to determine if the Pt particles were dispersed and if the bacteria were attached to the carbon electrode. The carbon electrode was successfully modified when exposed overnight to the Pt ink. The SEM images showed bacteria adhered to the carbon surface.

Biography

Myreisa Morales Cruz completed her Bachelor Degree in Chemistry and Doctoral studies at University of Puerto Rico, Rio Piedras Campus. She has been awarded with PRLSAMP fellowship from NSF, and RISE fellowship from NHI, during her Doctoral studies. She is currently working on "Microbial ureolysis systems."

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