Synthesis of Palladium Nanoparticles Stabilized on Glucose Oxidase Enzyme

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Recently, several methods of metallic nanoparticles synthesis using biological molecules has been proposed [1], where biomolecules are used as stabilizing agents, leading a class of compounds so-called bionanocomposites. For instance, this work report the synthesis of palladium nanoparticles (PdNPs) stabilized with glucose oxidase (GOx) enzyme. PdNP-Gox was obtained by chemical reduction by using hexachloropalladate (IV) ammonium salt and GOx in the presence of formic acid reduction agent. The kinetic formation reaction was evaluated by UV-VIS spectroscopy and it was observe that the law of kinetics of Pd^{+4} salt reductions is a first-order reaction, in which the rate constant *k* corresponds to 0,074. Also, PdNP with diameters of 3.5 nm were obtained, adopting well defined spherical structures. It was observed that GOx molecules affect the supramolecular distribution of PdNP, probably associated to the interaction between PdNP and functional groups of GOx, as evidenced in FTIR experiments.

Keywords: palladium nanoparticles, glucose oxidase

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[1] Crespilho, F.N., Lima, F.C.A., Oliveira Jr, O.N., A.B.F. da Silva, A., Zucolotto, V., *Chemical Physical Letters*, 469, 186-190, 2009.

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