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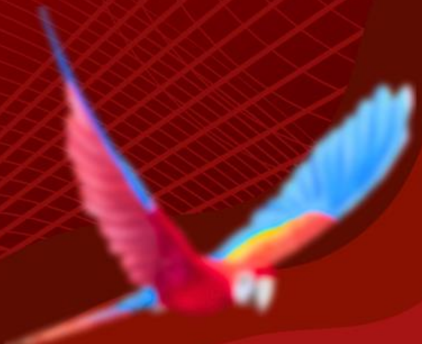

ORGANIZAÇÃO:

Evaluation of the electrocatalytic activity of silver phthalocyanine supported in Printex-L6 carbon for the oxygen reduction reaction

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Hydrogen Peroxide (H_2O_2) is an oxidizing agent used in chemical and biological processes, however, its industrial production from the anthraquinone reduction requires the use of big amounts of organic solvent, temperature and pressure, in addition to the risks associated with transportation and storage[1]. The electrogeneration of H_2O_2 *in situ* from the Oxygen Reduction Reaction (ORR) is a viable and advantageous alternative. The Printex-L6 carbon (PL6C) has been applied as an ORR electrocatalyst because it has carboxyl and carbonyl groups in its structure that favors the O_2 gas adsorption resulting in high selectivity for formation of H_2O_2 through the $2e^-$ transfer[2]. The electrocatalytic activity of PL6C for ORR can be enhanced by modifying it with silver phthalocyanine (AgPc). That way, the ORR studies in electrolyte (0.1 mol L^{-1} K_2SO_4) acid (pH= 3) and alkaline (pH= 9) were realized using a rotating ring-disk electrode (RRDE GC/Pt), Pt counter-electrode and reference electrode Ag/AgCl. In the RRDE surface was deposited the electrocatalyst matrices compound by PL6C unmodified and modified with 0.5, 1 and 1.5% of AgPc (w:w %). Cyclic and linear voltammetry were used to evaluate the behavior of the electrocatalysts and whit the data obtained were calculated the values of the selectivity for H_2O_2 formation and electrons number. The modification of PL6C with 1% de AgPc increase the selectivity of 90% to 97.5% for the ORR in alkaline medium. Already in acid medium the better modification was equivalent at 0.5% of AgPc increasing the selectivity of PL6C of 75% for 90.3%. In these conditions, the electron number was equivalent at 2.0 and 2.2 respectively for the ORR in alkaline and acid medium, establishing that the modifications made the PL6C more selectivity for H_2O_2 formation in both media. The morphology of the electrocatalysts were evaluated by electron microscopy techniques (SEM and TEM-EDS).

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References:

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[2] P. J. M. Cordeiro-Junior, et al. *J. Catal.*, 2020, doi: 10.1016/j.jcat.2020.09.020.