

Development of Yeast biofilm in presence of different quorum-sensing molecules immobilized on carbon felt: electrochemical properties and performance

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Quorum-sensing (QS) is a well-known cell signalling mechanism, significant in biofilm formation. Few works focused on yeast-biofilm using *Saccharomyces Cerevisiae*. In this work, three different aromatic alcohols, i.e. 2-phenylethanol, tyrosol and tryptophol, are immobilized on carbon felt (CF), and not simply dissolved in the anodic medium, to better exploit yeast and glucose in single chamber open-air cubic reactor. The three different QS molecules are attached to CF modified with polyethyleneimine (PEI) and then the chemical and electrochemical properties characterized in half cell tests. Lately, the CF-PEI-QS are used in single cell cubic reactors, and polarization, Maximum Power Density (MPD) and biofilm morphology are studied. Results show that adhesion of yeast increased for QS molecules compared to CF-PEI, as well as MPD, and 2-phenylethanol is the best. The biocatalyst is better entrapped and attached to the anode; yeast developed a good Extracellular Polymeric Substance (EPS) matrix, connecting more the cells in a conductive network.