Electrochemical oxidation of acetate by *Geobacter sulfurreducens*: Influence of anode materials

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The recent discovery of micro-organisms that could transfer directly electrons to insoluble electrode [1] had encouraged the researches on microbial fuel cells. The interfaces anode/micro-organism are explored to enhance the bacterial electron transfer and increase the power densities produced: some modified anodes have been designed, binding for example electron mediators (Mn$^{4+}$, neutral red …) to woven graphite [2]. Moreover the porosity of different forms of carbon has been found to influence current productions [3]. The purpose of this work was to compare the efficiency of graphite, DSA® and stainless steel as anode materials for growing *Geobacter sulfurreducens* under imposed potential conditions. Current densities obtained were seven times higher than values presented in literature [4] and depended on anode material. Analyses of the electrode surface with techniques like optical interferometry, SEM or confocal microscopy revealed significant differences in roughness and bacterial coverage, which may explain the variety of current densities obtained.