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OXIDATIVE SPECIES FORMED IN ACTIVE AND NON-ACTIVE ELECTRODES DURING DEGRADATION OF POLLUTANTS IN METHANOL

Resumo: New technologies are being developed for water treatment to remove pollutants from the environment, where electrochemical methods stand out for their efficiency. Different actives and non-actives electrodes had been used for degradation of pollutants, where through different species formed in solution can oxidize the contaminant efficiently [1]. In aqueous medium, different oxidative species formed with these types of anodes have been widely studied; hydroxyl radicals are main reactive specie formed during electro-oxidation, which are used to degrade pollutants. Some others species can also been formed, although these species have a lower redox potential than hydroxyl radicals, they can also degrade some organic contaminants by different mechanisms. On the other hand, the oxidative species formed during electrochemical oxidation in organic medium has not yet been deeply studied [2-3]. The identification of these species are crucial for understanding the reaction mechanism and the pathway that organic pollutant are removed when a solvent as methanol are used in the electrochemical treatment. Thus, the species formed in methanol medium using active and non- active anode during the electrochemical degradation of diuron were studied using Electron paramagnetic resonance (EPR) by spin-trapping methodology. In the degradation of diuron in methanol medium it was obtaining similar removals of 95,3% for active and 96.6% for non-active electrode, after 3h of electrolysis using sodium chlorine as electrolyte. Although the non-active anode achieved slightly greater removal, the decay of the diuron concentration was lower than the active electrode. Furthermore, different radical species were found by EPR, which promote the oxidation of the contaminant. Through simulations, it was determinate species such as chlorine radicals, carbon- and oxygen-based radicals were formed during electro-oxidation in methanol medium [4] . Some scavengers such as tert-butyl alcohol, potassium iodide and chloroform where also used to assess the formation and corroborating the role of these oxidative species in the degradation of diuron. It was demonstrated that the composition of the electrode affects the species formed into the solution; consequently, showing some variation in the removals of the pollutant, depending of the oxidizing potential of these species.

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