

EVALUATION OF ANTIOXIDANT RADICAL SCAVENGING ACTIVITY BY MEANS OF ELECTROGENERATED HYDROXYL RADICALS

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Hydroxyl radical is one of the most reactive radicals. The generation of HO[•] represents an important task in different areas, such as organic synthesis [1], oxidative stress studies [2] and in the detoxification of effluents [3].

The generation of hydroxyl radicals based on metal catalyzed decomposition of hydrogen peroxide, by Fenton or Fenton-like reactions, is the most spread method. In the context of the mineralization of organic compounds from aqueous media, several papers report the electrochemical generation of hydroxyl radical by the oxidation of water. Boron doped diamond electrodes (BDD) have been successfully used as anode material for the production of hydroxyl radicals.

The absence of chemical precursors is a great advantage of the electrochemical generation of HO[•] towards the Fenton-type reactions. The possible interference of the metal ions in antioxidant activity assays is also an important issue. In this context we tested the use of electrochemical generated HO[•] for the evaluation of antioxidant scavenging activity.

The antioxidant scavenging activity is evaluated by means of inhibition of the HO[•] mediated oxidation of a non-electroactive species (sodium benzoate).

The experimental conditions for the antioxidant scavenging activity assay were optimized namely, the anode material (Pt and BDD), current density and medium composition.

The oxidation reactions were monitored by fluorescence, cyclic voltammetry and HPLC (UV detection).

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References:

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