

Oxidative modification of proteins induced by electrogenerated HO radicals

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Most in vitro studies on the oxidative modifications associated to oxidative stress requires the in situ generation of oxygen radicals. The generation of hydroxyl radicals from the decomposition of hydrogen peroxide by metal cations is widely used for this purpose. It is recognized that results obtained in this way may be influenced by non-specific binding between the metal and the substrate [1].

In this context the electrochemical generation of hydroxyl radical can provide an alternative method that does not require the use of chemical precursors, is accessible and easy to perform.

The radicals generation is carried out by the electrooxidation of water by means of different electrode materials, such as boron doped diamond (BDD) and platinum (Pt), among others.

In the present work the oxidation of BSA is carried out in different conditions, in order to settle adequate experimental variables to perform the electrogeneration of hydroxyl radicals. Results from BSA oxidation using electrogenerated hydroxyl radicals are compared with those obtained using hydroxyl radicals generated by chemical means (Fenton-type reaction). The comparison is based on the extension of the impinged oxidative modifications quantified by the amount of carbonyl groups formed and the cleavage extension.

[1] T Kocha, M Yamaguchi, H Ohtaki, T Fukuda, T Aoyagi, BBA-Protein Struct M, 1997, 1337, 319-26