

Electrochemical and theoretical characterization of the electro-oxidation of dimethoxycurcumin

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Dimethoxycurcumin (DMC) ((1E,6E)-1-(3,4-dimethoxycyclohexyl)-7-(3,4-dimethoxyphenyl) hepta-1,6- diene-3,5-dione) is a natural polyphenolic compound that appears together with curcumin in turmeric. Both molecules have wide range biological activities as antioxidant, anti-inflammatory and anti-carcinogenic agent. To evaluate the oxidation process and kinetics for DMC, the rate constant, electron transfer and diffusion coefficients for the electrochemical oxidation were determined. Therefore, its electrochemical behavior over a platinum electrode in anhydrous media was investigated. Furthermore, DFT calculations were performed to give a rational explanation to the obtained results. All the results support the fact that the central $-\text{CH}_2-$ group is the most reactive against an oxidation process. © 2017

DFT

Dimethoxycurcumin

Electrochemical oxidation

Voltammetry

Electrodes

Electrooxidation

Polyphenolic compounds

Rate constants

Voltammetry

Anti-inflammatories

Carcinogenic agents

DFT calculation

Dimethoxycurcumin

Electrochemical behaviors

Electron transfer

Oxidation process

Platinum electrodes

Electrochemical oxidation