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Proecological Antioxidants for Stabilisation of Polymeric Composites

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Abstract : Electrochemical oxidation of dodecyl gallate (lauryl gallate), the main monomer flavanol found in green tea, was investigated on platinum electrodes using cyclic voltammetry (CV) and differential pulse (DPV) methods. The rate constant, electron transfer coefficient and diffusion coefficients were determined for dodecyl gallate electrochemical oxidation. The oxidation mechanism proceeds in sequential steps related to the hydroxyl groups in the aromatic ring of dodecyl gallate. Confirmed antioxidant activity of lauryl gallate verified its use in polymers as an environment-friendly stabiliser to improve the resistance to aging of the elastomeric materials. Based on the energy change of the deformation, cross-linking density and time of the oxygen induction with the TG method, we confirmed the high antioxidant activity of lauryl gallate in polymers. Moreover, the research on biodegradation confirmed the environment-friendly influence of the antioxidant by increasing the susceptibility of the elastomeric materials to disintegration by mildew mushrooms.

Keywords : polymers, flavonoids, stabilization, ageing
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