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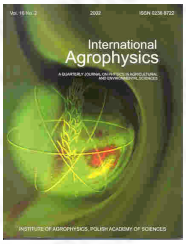

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Synthesis and properties of model humic substances derived from gallic acid

(get PDF)

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abstract A model humic acid (HA) was synthesized from a strong natural antioxidant, 3,4,5-trihydroxybenzoic acid (gallic acid-GA), in a slow oxidative polymerization/ condensation reaction catalysed by OH- at pH ca. 8. The resulting dark-brown product (HAG), acidified to pH ca. 2, did not precipitate from the reaction solution and it was isolated and purified by dialysis. Its physicochemical and spectroscopic properties, as determined by means of elemental analysis, high performance liquid chromatography (HPLC), Fourier transform infra red (FTIR), ultraviolet-visible (UV-VIS), fluorescence and electron paramagnetic resonance (EPR) spectroscopy, showed a close resemblance to natural humic substances. The antioxidative activity of HAG was assayed by quenching of chemiluminescence of lucigenin and compared to that of standard antioxidants. The similarity and differences between HAG and natural humic substances and the role of the HAG antioxidative activity are discussed.

keywords gallic acid, humic acid, spectroscopic and antioxidizing properties