

## INTERACTIONS OF OXYGEN MOLECULES AND PARAMAGNETIC CENTERS OF DOPA-MELANIN-Fe(III) COMPLEXES

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Properties of paramagnetic centers depend on existence of metal ions (Matuszczyk *et al.*, 2004, *Chem. Phys. Lett.*, 394, 366; Pilawa, Chodurek & Wilczok, 2003, *Appl. Magn. Reson.*, 24, 417) and paramagnetic oxygen O<sub>2</sub> molecules in the environment (Pilawa *et al.*, 2003, *Appl. Magn. Reson.*, 25, 105). In this work physical interactions of oxygen O<sub>2</sub> molecules with two types of paramagnetic centers in DOPA-melanin complexes with Fe(III) ions were examined.

DOPA-melanin was synthesized by autooxidative polymerization of 5 mM L-DOPA (L-3,4-dihydroxyphenylalanine, Sigma) in Tris-HCl buffer (0.05 M, pH 7.4) during 48 hrs at room temperature. The obtained sediment was separated by centrifugation, washed with deionized water and dried over phosphorous pentoxide.

To obtain DOPA-Fe<sup>3+</sup>-melanins, FeCl<sub>3</sub> was added to 5 mM solution of L-DOPA in Tris-HCl buffer (0.05 M, pH 7.4). The metal ions/DOPA molar ratios in the reaction mixtures were 2:1, 1:1 or 1:2. Melanin sediments formed after incubation during 48 hrs at room temperature were centrifuged, washed with deionized water and dried over phosphorous pentoxide. EPR measurements were performed by the use of an X-band (9.3 GHz) spectrometer with magnetic modulation of 100 kHz. Concentrations of paramagnetic centers in the melanin complexes and parameters of EPR spectra were determined. Superposition of EPR lines of paramagnetic centers in melanin and paramagnetic Fe(III) ions give the analysed spectra. Changes of EPR parameters and paramagnetic center concentrations in the oxygen environment were discussed.