

EPR study of paramagnetic centers in human blood

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Electron paramagnetic resonance investigations of paramagnetic centers in whole human blood were carried out at 170 K using X-band EPR spectrometer. The study included a group of patients and healthy volunteers. The EPR signals from high spin Fe^{3+} ions in transferrin ($g = 4.2$) and Cu^{2+} ions in ceruloplasmin ($g = 2.05$) are characteristic of each frozen blood sample. An overview of all recorded spectra revealed in several cases additional lines derived from high spin Fe^{3+} ions in methemoglobin ($g = 5.8 - 6$), free radicals ($g = 2.002 - 2.005$) and various low spin ferriheme complexes ($g = 2.21 - 2.91$). The lines from cytochromes ($g = 3.03$ and 3.27) were observed only twice. The EPR measurements have not confirmed the correlation between the occurrence of a particular type of low-spin iron complex and a specific disease entity. Moreover, the presence of EPR lines from trivalent iron also did not differentiate patients from healthy volunteers.