MAGNETIC INVESTIGATIONS OF HUMAN LIVER TISSUES

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9.7 cm

The lyophilized samples of the human liver have been investigated by means of electron paramagnetic resonance (EPR) spectroscopy and conventional magnetic methods over the temperature range 4 - 300 K.

The EPR spectrum recorded at room temperature consists of a broad signal originating from the Fe^{3+} ions of ferritin grains. The behavior of this signal upon changes in temperature is characteristic of a system of particles that undergoes transition into a superparamagnetic state. By lowering the temperature the intensity of this signal decreases and below 8 K this line disappears, suggesting the formation of an antiferromagnetically ordered phase. Additionally, below 100 K the signal originating from Fe^{2+} ions of hemoglobin can be observed which shows a ferromagnetic-like behavior upon decrease in temperature.

The temperature decay of d.c. susceptibility as well as ZFC-FC magnetization dependencies exhibit, besides of the diamagnetic contribution of the normal human tissue, two main magnetic contributions. One of them can be attributed to Fe^{2+} ions of hemoglobin and the second one, originating from the ferritin grains, which shows a transition into the superparamagnetic state at $T>20$ K.

13.4 cm

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