

MAGNETIC BIREFRINGENCE STUDY OF THE MAGNETIC CORE STRUCTURE OF FERRITIN

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It was shown that ferritin, the iron-storage protein, is an excellent reaction vessel for synthesis of some minerals inside its structural cage, in particular magnetite or maghemite (then it is named magnetoferritin). Discovery of biological magnetite in the human brain and relation of its presence with neurodegenerative diseases have prompted investigation of physicochemical properties of ferritin and magnetoferritin. Of particular interest is the search for methods allowing detection of magnetite inside ferritin proteins both *in vitro* and *in vivo*.

The paper presents results of magnetic birefringence measurements performed with biogenic ferritin (i.e. horse spleen ferritin) synthetic ferritin (magnetoferritin) and model nanoscale magnetite as well as some mixture modelling a heterogeneous structure of biogenic brain ferritin. TEM, crystallographical and magnetization measurements were also performed for further characterization of compounds studied. The behaviour of Δn in frame of Langevin formalism and for low field region respective Cotton-Mouton constants will be discussed. We show that magnetic birefringence can be useful for identification of magnetic core structure of biogenic ferritins, which can be of interest in biomedicine.

13.4 cm

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9.7 cm