

Magnetic studies of iron(III) – crosslinked chitosan

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The extensive research of metallo-organic chelating compounds is inspired by perspectives of industrial, ecological and biomedical applications. One of this type of metallo-organic materials are transition metal - chitosan complexes. Recent investigations of Fe-chitosan complexes were mainly concentrated on the analysis of their chemical structure. It has been found that both amino [-NH₂] and hydroxyl [-OH] groups chelate Fe(III) ions and more than one polymer chain is involved in the formation of the complex. Moreover, it has been indicated that Fe(III) ions are either penta- or hexa-coordinated and that at low temperatures these systems exhibit magnetic ordering. The iron clustering has been suggested as a plausible explanation for the observed magnetic behaviour. The lack of the extended magnetic characterization as well as satisfactory description of the magnetic ordering in Fe-chitosan (related partly to the uncertainty of their structure) became the reason for the present investigations. In this work the low-temperature *dc* and *ac* magnetic measurements are reported. The results obtained indicate that the iron atoms do not segregate in the polymer matrix forming clusters, as was suggested formerly, but the magnetic behaviour of Fe-chitosan is typical of a spin-glass-like rather than a superparamagnet.

9.7 cm

13.4 cm

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