

THE INFLUENCE OF MORPHOLOGY ON MAGNETIC PROPERTIES OF MAGNETOSOMES

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Magnetosomes are bacterial magnetic nanoparticles containing iron mineral magnetite (Fe₃O₄) or greigite (Fe₃S₄). These are small in size (20100 nm) disperse very well because they are covered with a stable biological membrane – a lipid bilayer admixed with proteins. In our experiment magnetosomes were synthesized by magnetotactic bacteria Magnetospirillum Magnetotacticum sp. AMB-1 in laboratory conditions. These bacteria produce magnetite (Fe₃O₄) bacterial nanoparticles. The cultivation process for this bacterium AMB-1 was changed. The culture medium was enriched by more amounts feric quinate (FQ magnetosomes sample) and more amount Wolfe's vitamin solution (WVS magnetosomes sample) comparing to normal culture medium (NS magnetosomes sample). The changes of cultivation process do not influence on magnetic properties of isolated magnetosomes. Soft increase of saturation moment for sample FQ to value 0,23 emu/g with compare 0,21 emu/g and 0,20 emu/g for sample WVS and NS to connect with enhancement size of magnetosomes in this sample (FQ). Soft increase of coercivity we can observe for the same sample FQ to value 4 Oe and 14 Oe for sample WVS and NS. The low values for coercivity connect with the fact that magnetosomes are still single-magnetic domain particles.

9.7 cm

13.4 cm

Subject category :

5. Nano-structure, Surfaces, and Interfaces

Presentation mode :

poster

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