

INVESTIGATIONS OF IRON MINERALS FORMED BY DISSIMILATORY ALKALIPHILIC BACTERIUM WITH ^{57}Fe MÖSSBAUER SPECTROSCOPY

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Anaerobic alkaliphilic bacteria *Geoalkalibacter ferrihydriticus* (strain Z-0531) isolated from a bottom sediment sample from the weakly mineralized soda Lake Khadyn. The strain uses the amorphous Fe(III)-hydroxide (AFH) as an electron acceptor and acetate CH_3COO^- as an electron donor. Mössbauer investigations of solid phase samples obtained during the process of the bacterium growth were carried out at room temperature, 77 K, 4.2 K without and with the presence of an external magnetic field (6 T) applied perpendicular to the γ -beam. The magnetic structure of obtained minerals was refined. The AFH and quinone concentration influence on iron reducing process were investigated. It has been found that the increase in AFH concentration leads to a decrease in siderite content and to an increase in the content of the magnetically ordered phases. The quinone concentration has a significant influence on the size of the particles of magnetically ordered phases. The concentration range of AFH 30 mM-70 mM and quinone 0.7 g/l – 1.0 g/l are the regions of unstable phase formations by strain Z-0531 for which the process of biomineralization is sensitive to fluctuations in bacterium cell number.

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