



EFFECT OF GAMMA RADIATION ON THE FERRITIN ACTIVITY

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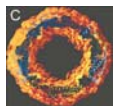
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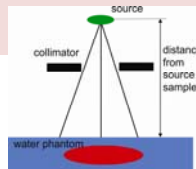
Introduction/Purpose

The aim of this study was to investigate the effect of gamma radiation from ⁶⁰Co on some elements of iron homeostasis. To achieve this objective, the following tasks were defined: Electrochemical studies of samples exposed radiation in different doses of source ⁶⁰Co. Analysis of results.

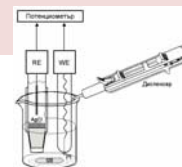
Materials & Methods:



Molecule of ferritin (A) general view, (B) cross-section of the protein shell (apoferritin) without mineral core

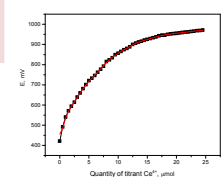


Experimental set – up

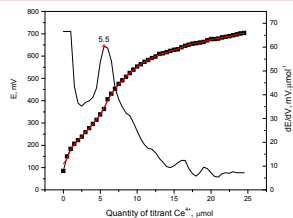


Experimental set-up for potentiometric titration. WE - platinum Pt working electrode, RE - Ag / AgCl reference electrode, SB - magnetic stirrer. Individual elements of the scheme are in different scales.

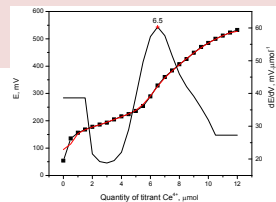
Results:



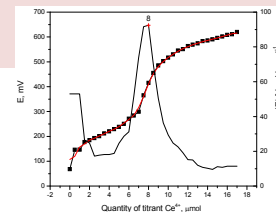
Titration curves for the 2 Gy irradiation ferritin without any exogenous reducing agent in the medium. Step titration - 0.5 μmol Ce⁴⁺ / 2 min



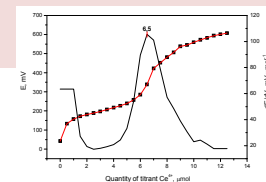
Titration curve for irradiated ferritin after incubation in the presence of 2 mg of AA for 60 min. Titration conditions are the same as in the previous figure. Left scale refers to the measured redox potential and the right of the size of the resulting derivative



Titration curves of ferritin irradiated with a dose of 0.1 Gy. The other conditions are the same as in the previous figure.



Titration curves of ferritin irradiated with a dose of 12 Gy. The other conditions are the same as in the previous figure.



Titration curves of ferritin irradiated with 12 Gy dose and subsequently treated with a heat treatment in a water bath at 90°C for 30 minutes

Conclusion: The effect of gamma radiation on some of ⁶⁰Co porotsesi associated with homeostasis of iron and, in particular, no change in the conformation of Ferritin molecule responsible for the regulation of the physiological level of iron has been studied. The results reveals a less obvious effect, requiring a more complex interpretation. On this ground, a work hypothesis for the mechanism for radiation forced intensified mobilization of iron from ferritin mineral core has been proposed.