

EPR STUDY OF CO<sub>2</sub><sup>-</sup> RADICALS INDUCED  
BY γ- AND UV-RADIATION IN BIOAPATITES

*I.P. Vorona, N.P. Baran, S.S. Ishchenko*

Institute for Semiconductor Physics,  
Nat. Acad. Sci. of Ukraine  
(45, Nauky Prosp., Kyiv 03028, Ukraine)

S u m m a r y

EPR study of the bioapatites powders irradiated by UV and γ-rays is carried out. The EPR spectra of all samples are determined by the signals from CO<sub>2</sub><sup>-</sup> radicals. Its amounts in enamel, dentine, and bone are in the ratio 10:2:1 for γ-irradiation and 100:1:1 for UV one. The study of enamel plates showed that there are two types of CO<sub>2</sub><sup>-</sup>: ordered and randomized. Its ratio depends on the irradiation type. The contribution of oriented radicals is (30–37)% for UV irradiation and (16–17)% for γ-irradiation. The experimental results are explained on the basis of a model involving the existence of two different precursors. These precursors are CO<sub>3</sub><sup>2-</sup> molecular ions located in the *B* position of the apatite lattice. Its distinction consists in the presence or absence of a crystal lattice defect nearby.