

⁹⁰SR IN MAMMAL TEETH FROM CONTAMINATED AREAS IN FORMER SOVIET UNION MEASURED BY IMAGING PLATES

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Radioactive strontium contained in mammal teeth of contaminated area would give doses to enamel and dentin so that sometimes those doses have to be considered in evaluating retrospective dosimetry of such teeth. We used imaging plates (IP), sensitive to beta rays, to obtain the images of beta ray emitters in tooth samples taken from mammals collected in contaminated area of former Soviet Union. Luminescence induced by red laser stimulation is detected after placing the sliced samples on the plate made of BaFBr : Eu²⁺ for one week.

The mammal tooth samples from these regions contain ⁹⁰Sr, detectable by IP. After slicing the samples to a thickness of 1mm, they were placed on an imaging plate together with standard samples for one week in a lead cave, protecting natural radiation from the outside. The plates were measured by Fuji BAS-1800 II, then, the obtained images were processed with Multi Gauge v. 3.0. The average concentrations of ⁹⁰Sr in the samples were obtained by comparing the intensities of the luminescence with those of the standard samples.

The results were compared with the level of soil contamination. The concentrations were 6.0 Bq/g and 5.8 Bq/g in samples from Kuyash and Ozyorskoe where the soil contamination level is high while, one from Kasly where the soil contamination level is low, showed a value of 0.03 Bq/g. We found a positive correlation between the concentrations of ⁹⁰Sr in mammal teeth and the soil contamination level. In the region of Semipalatinsk nuclear test site, it the value is fairly constant about 0.30 Bq/g while, in Balapan, it is higher than 0.60 Bq/g. The samples from a village named Dolon showed 0.30 Bq/g where radioactive cloud passed through at the time of an atmospheric nuclear test.