The radioactivity of bottled mineral waters

Vršková Marta, Babaríková Františka, Belanová Alena

Water Research Institute, Nábr. L.Svobodu 5, 812 49 Bratislava, Slovakia

Recently, there has been observed an increased trend in consumption of natural mineral waters, which in many cases serve as substitutes for drinking water.

Mineral waters with increased contents of minerals (total mineralization ranging from 1000 to 4000 mg.dm-3) can also contain increased concentrations of natural radionuclides. For this reason it is necessary to monitor radioactivity of mineral and thermal springs. Hundreds of springs which are used for drinking purposes are spread in many regions all over Slovakia.

In our laboratory we determinated these radionuclides in mineral waters: total alfa, total beta, volume activity 222Rn, concentration of Unat, volume ^{226}Ra, ^{228}Ra and ^{210}Po. From values of determinated volume activities of radionuclides we calculated total effective dose from reception mineral waters.

For calculation of effective dose $E_{j,ing}$ [Sv. year^{-1}] from intake radionuclide ***j*** we use equation:

$$E_{j,ing} = a_j \times V \times h(g)_{j,ing}$$

Where a_j is volume activity of radionuclide *j* in water [Bq.l^{-1}],

V volume of consume mineral water during year [l. year^{-1}],

$h(g)_{j,ing}$ conversion factor of radionuclide j for conversion activity to dose [Sv.Bq^{-1}].

By calculation of effective dose we supposed consumption of mineral water 150 l.year^{-1} (0,4 l.day^{-1}) for adults (according to UNSCEAR). Conversion factors are initiated in the regulation of Ministry of Health of Slovak Republic (MZ SR #12/2001).

References

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