Assessment of gross $\alpha$ and $\beta$ radioactivity for drinking water in Hatay province, Turkey

Muttalip Ergun Turgay, A. Necmeddin Yazici, Halim Taskin, Erol Kam, Gürsel Karahan

*Faculty of Engineering, Department Physics, GAÜN, 27310 Gaziantep, Turkey, Tel./Fax: +90 542 417 85 85; email: eturgay20@hotmail.com (M.E. Turgay), Tel. +90 532 799 77 98; email: yazici@gantep.edu.tr (A.N. Yazici)

TAEK, Çekmeköe Nuclear Research and Training Centre, Altinsehir Yolu, Halkali, 34303 Istanbul, Turkey, Tel. +90 536 335 56 70; email: halimtaskin@gmail.com (H. Taskin), Tel. +90 535 365 19 48; email: erolkam@hotmail.com (E. Kam), Tel. +90 535 669 72 73; email: karahang@yahoo.com (G. Karahan)

Received 30 May 2014; Accepted 14 December 2014

ABSTRACT

In this study, the radioactivity analysis was performed in drinking water of Hatay province which is in the southeast region of Turkey. Using ten channels low-level proportional counter, the average “gross $\alpha$” and “gross $\beta$” activity concentrations of the 39 water samples were measured as 36.69 and 116.36 mBq/L, respectively. All values of the “gross $\alpha$” and “gross $\beta$” were lower than the limit values of 500 and 1,000 mBq/L, recommended by World Health Organization (WHO). The average annual effective doses were calculated to be 7.50 $\mu$Sv for the $\alpha$-emitters and 58.61 $\mu$Sv for the $\beta$-emitters. The results obtained in this study indicate that the average annual effective doses for all water samples are below the reference level as 0.1 mSv, recommended by WHO.

Keywords: Radioactivity; Gross $\alpha$; Gross $\beta$; Annual effective dose; Water; Hatay