

SGL045-P06

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Inter comparison of gamma ray doses calculated from U, Th, K contents and measured by NaI detector

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It is an important issue to obtain consistent results with different methods for dose rate determination. In the present study, the natural gamma ray dose rate calculated from U, Th, K and water contents in the sediments was compared with the value obtained by in-situ measurement with a NaI detector (JSM-102, Aloka).

Compressed powder sample was left for 10 days or more after packing to have radioactive equilibrium of radon attained. Then, the sample was measured for 7 days by a low background pure Ge detector. The concentrations of U, Th and K were calculated from the peak intensities of ²²⁶Ra, ²¹⁴Pb, ²¹⁴Bi, ²¹²Pb, ²²⁸Ac, ²⁰⁸Tl, ²¹²Bi, ²⁰⁸Tl, and ⁴⁰K, after subtracting background, in comparison with those of a standard sample, a GSJ Geochemical Reference sample, JG-3.

The NaI detector probe of 3" diameter was inserted to a hole of the sediment of interest and a spectrum is obtained for 30 min. The dose rate was calculated from the obtained gamma ray spectrum by the special software made by Aloka (GE function). We also employed of the "threshold" technique (Mercier and Falgueres, 2007) for the spectrum obtained by NaI detector to obtain U, Th and K concentrations.