6 - 35 Measurement Results of Soil Radiation Level around HIRFL in 2012

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According to the regulation of Environmental Protection Agency, the radiation level of soil around HIRFL had been measured. In order to make an objective appraisal on the radioactivity of the HIRFL, the soil was sampled from 4 sites, 3 around HIRFL, which is North of CSRe, South of CSRe and North of 6[#] building and 1 is as the contrast sample at South lake park. Sampling processes follow the requirement of Gamma spectrometry method of analyzing radionuclides in soil^[1]. Soil amount of each sample isabout 500 g and which is put into a cylindrical box uniformly just as the same of standard source.

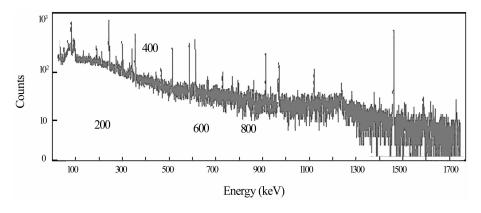


Fig. 1 The gamma spectrum of the North of 6# building.

Radio nuclide sactivity including ²³⁸ U, ²³² Th, ²²⁶ Ra and ⁴⁰ K in soil had been measured by Anti-Compton gamma spectrometer which was produced by ORTEC Company. Fig. 1 shows a measured gamma spectrum. Compare the gamma spectra of sample and standard source, the radionuclides specific activity can be obtained from the ratio of the net area of characteristic peaks. The results are shown in Table 1. Table 2 shows the land background of radionuclide activity in China^[2].

Table 1 Measurement results of the soil sample in 2012

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Site –	Nuclides (Bq/kg)				
	⁴⁰ K	²²⁶ Ra	²³⁸ U	²³² Th	
South lake park	1248.399	113.593	14.298	2.856	
North of CSRe	1241.095	115.655	10.899	2.333	
South of CSRe	1400.829	123.655	12.264	2.694	
North of 6 [#] building	1266.976	117.389	11.58	2.347	

Table 2 National land radionuclides background

Siz.	Nuclides (Bq/kg)				
Site	⁴⁰ K	²²⁶ Ra	²³⁸ U	²³² Th	
National landradionuclide content	11.5~2185.2	2.4~425.8	1.8~520	1.0~437.8	

It can be seen from Tables 1 and 2 that the ²³⁸ U, ²³² Th, ²²⁶ Ra and ⁴⁰ K specific activity in soil around HIRFL are within the region of national land radionuclide activity. The soil radionuclides specific activity around HIRFL show no difference compare with contradistinguishing sample.

References

^[1] GB 11743 \sim 1989, Gamma Spectrometry Method of Analyzing Radionuclides in Soil.

^[2] He Zhengyun, Luo Guozhen, Huang Jiaju, Radiation Protection, 2(1992)90.