

Development of extremely low-level neutron by activation method and its application to various environments

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2003 Fiscal Year Final Research Report Summary

DEVELOPMENT OF EXTREMELY LOW-LEVEL NEUTRON BY ACTIVATION METHOD AND ITS APPLICATION TO VARIOUS ENVIRONMENTS.

Research Project

Project/Area Number

13358010

Research Category

Grant-in-Aid for Scientific Research (A)

Allocation Type

Single-year Grants

Section

展開研究

Research Field

環境影響評価(含放射線生物学)

Research Institution

LOW LEVEL RADIOACTIVITY LABORATORY, K-INET, KANAZAWA UNIVERSITY

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Project Period (FY)

2001 – 2003

Keywords

neutron / environmenta neutron / activation / gamma-ray measurement / Au-198

Research Abstract

(1)Anti-coincidence method by using Plastic Scintillation counter was applied to reduce background counts of the Ge detectors in Ogoya underground laboratory(OUL). Results obtained by fundamental research were presented at the International Conference of Low-Level Radioactivity Measurements Techniques(LLRMT) held 6n Oct.13-

17, 2003 at Vienna, Austria.

(2) Fundamental parameters for the measurement of low-level neutrons by activation technique were determined under the operation of small reactor of UTR, Kinki(1W).

(3) Environmental neutron has been monitored at Rokkasho-mura, Aomori Pref. Results were reported at the International Conf. JEL ; d at Maidstone, England Sep.19-26,2002 and published in "Environmental Radiochemical Analysis II".

(4) Level of environmental neutron in sea water of the range of 0 to 4m was measured three times at Ogi marine Research Laboratory. Small maximum of thermal neutron flux was observed at 5-10cm depth, which agrees well with theoretical calculation.

(5) Neutron flux has been monitored regularly at Tatsunokuchi(35m above sea level) and Shishiku Highland(640m).

(6) Separation method of Eu and Ac was developed to detect extremely low-level Eu-152 produced by Atomic Bomb in 1945.

(7) Eu-152 measurements of Hiroshima granite samples were reported for the publication of DS02 (Dosimetry System 2002 for the evaluation of radiation dose of Hiroshima and Nagasaki Atomic Bomb in 1945).

(8) Results of Co-60 measurement in the spoons exposed to the JCO criticality accident were published in J.E.R.

(9) Got prize from Radiation Effect Research Association for the contribution to extremely low-level neutron measurement by activation method.(Mar.2003).

Research Products (15 results)

All Other

All Publications

[Publications] K.Komura, Y.Hamajima: "Ogoya underground laboratory for the measurement of Extremely low-levels of environmental radioactivity - Review of recent projects -" Journal of Applied Radiation and Isotopes. 不明(校正済印刷中). (2004) ▼

[Publications] Y.Hamajima, K.Komura: "Background component of Ge detectors in Ogoya Underground Laboratory" Journal of Applied Radiation and Isotopes. 不明(校正済印刷中). (2004) ▼

[Publications] M.Murata, T.Muroyama, T.Imanaka, M.Yamamoto, K.Komura: "Estimation of fast neutron fluence released by the Tokai-mura criticality accident from Mn-54 in soils collected from the JCO grounds." Journal of Radioanalytical and Nuclear Chemistry. 255 · 2. 359-364 (2003) ▼

[Publications] M.Inoue, H.Kofuji, M.Yamamoto, H.Sasagawa, K.Komura: "Application of low background gamma-ray spectrometry to environmental samples : Water leaching treatment for ^{40}K -removal" Journal of Radioanalytical and Nuclear Chemistry. 254 · 1. 211-215 (2003) ▼

[Publications] 山西弘城, 三宅均, 山崎直, 小村知久: "トンネルを利用したTLDとガラス線量計の自己線量の測定" 保健物理. 38. 45-49 (2003) ▼

[Publications] Mikael Hult, Maria Jose Martinez Canet, Peter N.Johnston, Kazuhisa: "Thermal neutron fluence from ultra low-level g-ray spectrometry of spoons activated during the JCO criticality accident at Tokai-mura in 1999" Journal of Environmental Radioactivity. 60. 307-318 (2002) ▼

[Publications] K.Komura: "Environmental Radiochemical Analysis II" The Royal Society of Chemistry(英国化学会). 417 (2003) ▼

[Publications] K.Komura, Y.Hamajima: "Ogoya Underground Laboratory for the Measurement of Extremely Low-Level Environmental Radioactivity Review of Recent Projects Carried out at OUL" J.Applied Radiation and Isotopes. (in printing). (2004) ▼

[Publications] Y.Hamajima, K.Komura: "Background component of Ge detectors in Ogoya Underground Laboratory" J.Applied Radiation and Isotopes. (in printing). (2004) ▼

[Publications] Y.Murata, T.Muroyama, T.Imanaka, M.Yamamoto, K.Komura: "Estimation of fast neutron fluence released by the Tokai-mura criticality accident from Mn-54 in soil from the JCO grounds" J.Radioanal.Nucl.Cheml. 255(2). 359-364 (2003) ▼

[Publications] H.Yamanishi, H.Miyake, T.Yamazaki, K.Komura: "Measurement of self-dose of TLD and Glass Dosimeter using tunnel." Japanese Journal of Health Physics. 38(1). 45-49 (2003) ▼

[Publications] M.Inoue, H.Kofuji, M.Yamamoto, H.Sasagawa, K.Komura: "Application of low background gamma-ray spectrometry to environmental samples : Water leaching treatment for ^{40}K -removal" J.Radioanal.Nucl.Cheml.. 255(1). 211-215 (2003) ▼

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[Publications] Y.Murata, M.Yamamoto, K.Komura: "Determination of low-level Mn-54 in soil by ultra low-background gamma-ray spectrometry after radiochemical separation" J.Radioanal.Nucl.Cheml.. 254(2). 249-253 (2002) ▼

[Publications] K.Komura: "Ultra low-background gamma spectrometry for the monitoring of environmental neutrons" Environmental Radiochemical Analysis(ed.P.Warwick)(Athenacum Press Ltd, Gateshead, Tyne & Wear, UK). II. 55-59 (2003) ▼

