

Measurement Services from NPL

NPL Environmental Radioactivity Proficiency Test
Exercise 2007 Workshop

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What can NPL Do?

Standardised
Solutions

Bq g⁻¹ - GBq g⁻¹ ³H to ²⁴⁴Cm



Radioactive
Gas standards

³H, ¹¹C, ⁸⁵Kr, ¹³³Xe, ²²²Rn, Tritium Monitors



Customer Source
Measurement

Large Area Sources, Solutions etc



Good Practice Guides

www.npl.co.uk/irmf/publications.html



Open meetings

LSUF, NSUF, IRMF, RCUF, ARMF
www.npl.co.uk/ionrad/clubs/



Rare Isotopes

^{208}Po , ^{237}Np , ^{99}Tc



Mass Separated Isotopes

^{152}Eu , ^{239}Pu , ^{242}Pu ,
 ^{243}Am , ^{238}U

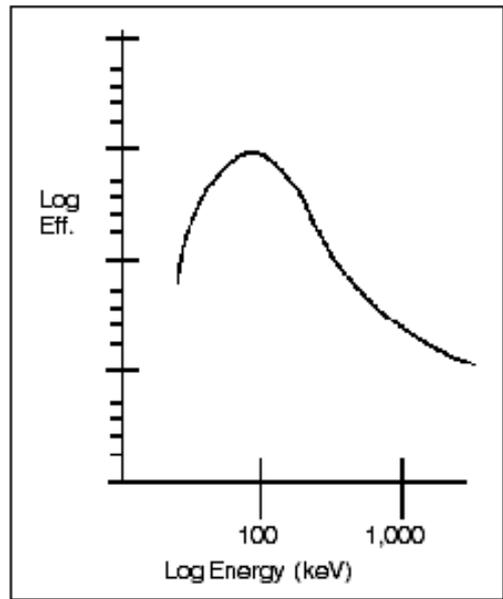


Nuclide	Activity Concentration Bq/g
Am241	10, 300, 10000
Am243	1, 100
C14	100, 2000
Cm244	2.5, 50, 1000, 20000
Cs134	10
Cs137	10
Eu152	50
H3	10, 100
Mixed	1000
Mixed	10000
Np237	10000
Pb210	1, 350, 40000
Po208	10, 150, 3300
Pu239	2.5, 50, 20000
Pu242	1, 12.5
Sr90	100
Tc99	100
Th229	1, 10
U232	1, 90, 5000
U238	10, 100

- ^{51}Cr replaces ^{203}Hg . Preparing solid standards possible.
- Addition of ^{54}Mn and ^{65}Zn to improve the calibration
- Gamma emission rate uncertainties reduced to 2 % ($k=2$)
- Two batches per year

Place Order	For Delivery	Reference Date
September	November	01-Jan
February	April	01-Jun

Mixed Nuclide



Nuclide	Gamma Energy (keV)	Gamma Emission Rate per Unit Mass ($\gamma \text{ s}^{-1} \text{ g}^{-1}$)	Gamma Emission Probability (%)
Americium-241	59.5409 ± 0.0002	18.19 ± 0.12	35.78 ± 0.18
Cadmium-109	88.0336 ± 0.0002	10.00 ± 0.22	3.626 ± 0.052
Cobalt-57	122.06065 ± 0.00024	9.07 ± 0.12	85.51 ± 0.12
Cerium-139	165.857 ± 0.006	8.90 ± 0.16	79.90 ± 0.08
Chromium-51	320.0835 ± 0.0008	20.00 ± 0.34	9.87 ± 0.10
Tin-113	391.698 ± 0.006	22.84 ± 0.34	64.97 ± 0.34
Strontium-85	514.0048 ± 0.0044	38.4 ± 0.6	98.5 ± 0.8
Caesium-137	661.657 ± 0.006	41.40 ± 0.42	84.99 ± 0.40
Manganese-54	834.838 ± 0.010	46.44 ± 0.32	99.9746 ± 0.0022
Yttrium-88	898.036 ± 0.008	75.1 ± 0.8	93.90 ± 0.46
Zinc-65	1115.539 ± 0.004	54.0 ± 0.8	50.22 ± 0.22
Cobalt-60	1173.228 ± 0.006	57.31 ± 0.36	99.85 ± 0.06
Cobalt-60	1332.492 ± 0.008	57.39 ± 0.36	99.9826 ± 0.0012
Yttrium-88	1836.052 ± 0.026	79.4 ± 0.6	99.32 ± 0.06

- Over 100 nuclides in stock at NPL ^3H to ^{244}Cm
- ^7Be , ^{11}C , ^{18}F , ^{86}Rb , ^{56}Mn , ^{89}Sr , $^{93\text{m}}\text{Nb}$, $^{95\text{m}}\text{Tc}$, $^{99\text{m}}\text{Tc}$, ^{239}Np .
- Short lived fission products (^{99}Mo , ^{111}Ag , ^{140}Ba , ^{147}Nd , ^{153}Sm , etc)
- ^{14}C barium carbonate
- Activity from Bq g^{-1} - GBq g^{-1}
- Solution volumes from $> 1\text{ mL}$ to 10 mL in ampoules.
Up to to 1000 mL in plastic bottles

Thank you

Radioactivity Customer Services

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Web Site

www.npl.co.uk/measurement_services/ms_RR.html