

# Solutions for gamma spectrometry

## NPL mixed nuclides

The NPL 'Mixed Nuclide' solution contains a set of radionuclides with fourteen gamma lines between 60 keV and 1836 keV. The relative activities of the radionuclides in the mixtures have been adjusted so that the relative intensities of the peaks in the gamma-spectrum are optimum at the reference date. If dilution is required, the NPL inactive carrier solution should be used so that the radionuclides are not adsorbed on the walls of any vessels.

The 'Mixed Nuclide' is available at three activity concentrations **including large volume activity products, saving you time performing dilutions:**

1. NPL Product Code R08-01:	500 g HDPE bottle, total activity 5 kBq
2. NPL Product Code R08-03:	10 g flame sealed glass ampoule, total activity 10 kBq
3. NPL Product Code R08-04:	10 g flame sealed glass ampoule, total activity 100 kBq

A limited quantity of the Mixed Nuclide is prepared annually in the spring. Stocks will be allocated subject to receipt of purchase orders. (Reference Date 1st June)  
Despatch dates to be confirmed once produced.



### R08-01

5 kBq in 500 ml HDPE Bottle  
Chemical form - 4 mol HCl

### R08-03

10 kBq in 10 ml Flame Sealed Ampoule  
Chemical form - 4 mol HCl

### R08-04

100 kBq in 10 ml Flame Sealed Ampoule  
Chemical form - 4 mol HCl

Nuclide	Bq/g	Gamma Emission Rate s <sup>-1</sup> g <sup>-1</sup>
<sup>241</sup> Am	0.53	0.19
<sup>109</sup> Cd	2.76	0.10
<sup>57</sup> Co	0.11	0.09
<sup>139</sup> Ce	0.11	0.09
<sup>51</sup> Cr	2.03	0.20
<sup>113</sup> Sn	0.40	0.26
<sup>85</sup> Sr	0.39	0.38
<sup>137</sup> Cs	0.49	0.42
<sup>54</sup> Mn	0.47	0.47
<sup>65</sup> Zn	1.12	0.53
<sup>60</sup> Co	0.56	0.56
<sup>88</sup> Y	0.80	0.80

Nuclide	Bq/g	Gamma Emission Rate s <sup>-1</sup> g <sup>-1</sup>
<sup>241</sup> Am	53	19
<sup>109</sup> Cd	276	10
<sup>57</sup> Co	11	9
<sup>139</sup> Ce	11	9
<sup>51</sup> Cr	203	20
<sup>113</sup> Sn	40	26
<sup>85</sup> Sr	39	38
<sup>137</sup> Cs	49	42
<sup>54</sup> Mn	47	47
<sup>65</sup> Zn	112	53
<sup>60</sup> Co	56	56
<sup>88</sup> Y	80	80

Nuclide	Bq/g	Gamma Emission Rate s <sup>-1</sup> g <sup>-1</sup>
<sup>241</sup> Am	530	190
<sup>109</sup> Cd	2060	100
<sup>57</sup> Co	110	90
<sup>139</sup> Ce	110	90
<sup>51</sup> Cr	2030	200
<sup>113</sup> Sn	400	260
<sup>85</sup> Sr	390	380
<sup>137</sup> Cs	490	420
<sup>54</sup> Mn	470	470
<sup>65</sup> Zn	1120	530
<sup>60</sup> Co	560	560
<sup>88</sup> Y	800	800

Carrier Solution 500 g nominal of 4 mol dm<sup>-3</sup> HCl with 50 µg g<sup>-1</sup> of Cd, Co, Ce, Cr, Sn, Sr, Cs, Mn, Zn, Y.

