Key comparison BIPM.RI(II)-K1.Sm-153

MEASURAND : **Equivalent activity of ^{153}Sm**

x_i: **result of measurement carried out in the SIR for the sample submitted by laboratory i**

u_i: **combined standard uncertainty of x_i**

Lab i	x_i / kBq	u_i / kBq	Date of measurement
NIST	576800	4700	1998-06-23
PTB	571700	3100	1999-04-27
NPL	574700	2900	1999-07-09
BNM-LNHB	571700	1100	2003-09-11
ANSTO	565500	8100	2004-09-22

Key comparison BIPM.RI(II)-K1.Sm-153

MEASURAND : **Equivalent activity of ^{153}Sm**

Key comparison reference value: the SIR reference value for this radionuclide x_R is 573.7 MBq,
with a standard uncertainty u_R of 1.2 MBq, , see section 4.1 of *Metrologia*, 2004, 41, *Tech. Suppl*., 06012.

The degree of equivalence of each laboratory with respect to the reference value is given by a pair of terms:
$D_i = (x_i - x_R)$ and U_i, its expanded uncertainty ($k = 2$), both expressed in MBq, with n the number of laboratories,
$U_i = 2[(1 - 2/n)u_i^2 + (1/n^2)\Sigma u_i^2]^{1/2}$ when each laboratory has contributed to the computation of x_R

The degree of equivalence between two laboratories is given by a pair of terms:
$D_{ij} = D_i - D_j = (x_i - x_j)$ and U_{ij}, its expanded uncertainty ($k = 2$), both expressed in MBq.
The approximation $U_{ij} \sim 2(u_i^2 + u_j^2)^{1/2}$ is used in the following table.

Lab _j_ ⟹

Lab _i_ ⟱

	D_i	U_i	NIST D_{ij}	U_{ij}	PTB D_{ij}	U_{ij}	NPL D_{ij}	U_{ij}	BNM-LNHB D_{ij}	U_{ij}	ANSTO D_{ij}	U_{ij}
	/MBq		/MBq		/MBq		/MBq		/MBq		/MBq	
NIST	3.1	7.4			5.1	11.3	2.1	11.0	5.1	9.7	11.3	18.7
PTB	-2.0	5.4	-5.1	11.3			-3.0	8.5	0.0	6.6	6.2	17.3
NPL	1.0	5.2	-2.1	11.0	3.0	8.5			3.0	6.2	9.2	17.2
BNM-LNHB	-2.0	3.6	-5.1	9.7	0.0	6.6	-3.0	6.2			6.2	16.3
ANSTO	-8.2	16.5	-11.3	18.7	-6.2	17.3	-9.2	17.2	-6.2	16.3		

BIPM.RI(II)-K1.Sm-153

Degrees of equivalence for equivalent activity of ^{153}Sm