

BIPM.RI(II)-K1.Np-237 and EUROMET.RI(II)-K2.Np-237**Key comparison BIPM.RI(II)-K1.Np-237****MEASURAND : Equivalent activity of ^{237}Np** 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
BIPM	75440	790	12-06-1998
PTB	74740	220	02-02-2006
IRMM	74950	180	27-02-2007

Key comparison EUROMET.RI(II)-K2.Np-237**MEASURAND : Equivalent activity of ^{237}Np** x_i : result of measurement carried out at laboratory i converted to the equivalent activity through the linking laboratories BIPM, PTB and the IRMM (see Final Report). u_i : combined standard uncertainty of x_i

Lab i	x_i / kBq	u_i / kBq	Year of measurement
LNE-LNHB	75210	230	1998
CIEMAT	75510	380	1999
NPL	74210	450	1998
NRC	74060	820	1998

BIPM.RI(II)-K1.Np-237 and EUROMET.RI(II)-K2.Np-237

MEASURAND : Equivalent activity of ^{237}Np

Key comparison BIPM.RI(II)-K1.Np-237

Key comparison reference value: the SIR reference value for this radionuclide is $x_R = 74.85$ MBq with a standard uncertainty, $u_R = 0.11$ MBq.

x_R is obtained as the mean of two of the three results (see Section 4.1 of the Final Report).

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

$U_i = 2((1 - 2/n)u_i^2 + (1/n^2)\sum u_i^2)^{1/2}$ when each laboratory has contributed to the calculation 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 Matrix of equivalence.

Linking EUROMET.RI(II)-K2.Np-237 to BIPM.RI(II)-K1.Np-237

The value x_i is the equivalent activity for laboratory i participant in EUROMET.RI(II)-K2.Np-237

having been normalized using the SIR measurements of the BIPM, PTB and the IRMM as linking laboratories.

The degree of equivalence of laboratory i participant in EUROMET.RI(II)-K2.Np-237 with respect to the key comparison 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.

The approximation $U_i = 2(u_i^2 + u_R^2)^{1/2}$ is used in the Matrix of equivalence.

The degree of equivalence between two laboratories i and j , one participant in BIPM.RI(II)-K1.Np-237 and one in EUROMET.RI(II)-K2.Np-237, or both participant in EUROMET.RI(II)-K2.Np-237, is given by a pair of terms both expressed in MBq: $D_{ij} = D_i - D_j$ and U_{ij} , its expanded uncertainty ($k = 2$), approximated by $U_{ij} = 2(u_i^2 + u_j^2 - 2fu_i^2)^{1/2}$ with u_i being the standard uncertainty of the link when each laboratory is from the EUROMET and f is the correlation coefficient.

These statements make it possible to extend the BIPM.RI(II)-K1.Np-237 matrix of equivalence to all participants in EUROMET.RI(II)-K2.Np-237.

BIPM.RI(II)-K1.Np-237 and EUROMET.RI(II)-K2.Np-237

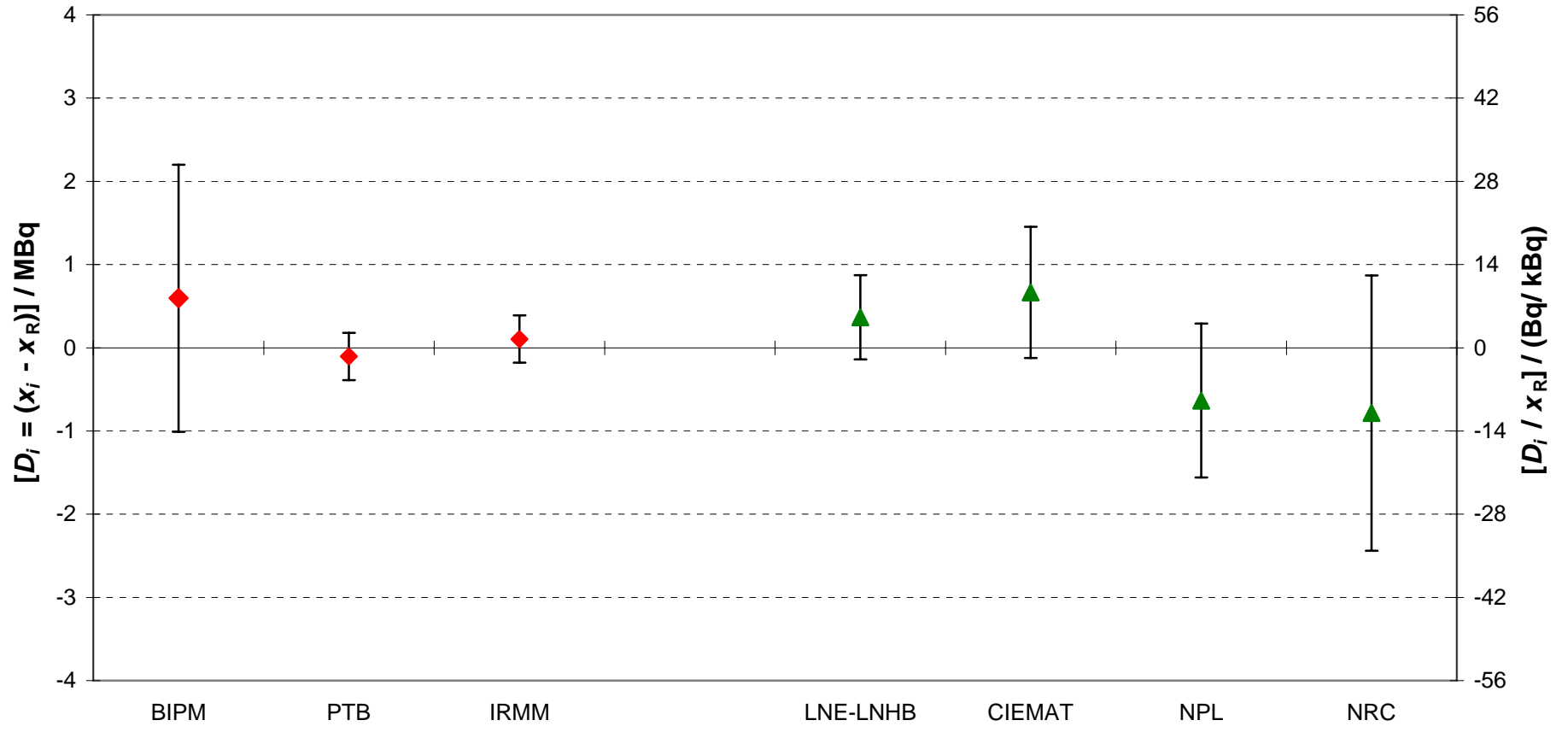
MEASURAND : Equivalent activity of ²³⁷Np

Lab *j* \Rightarrow

Lab *i* \Downarrow

	D_i U_i / MBq		BIPM		PTB		IRMM		LNE-LNHB		CIEMAT		NPL		NRC	
	D_{ij} / MBq	U_{ij} / MBq	D_{ij} / MBq	U_{ij} / MBq	D_{ij} / MBq	U_{ij} / MBq	D_{ij} / MBq	U_{ij} / MBq	D_{ij} / MBq	U_{ij} / MBq	D_{ij} / MBq	U_{ij} / MBq	D_{ij} / MBq	U_{ij} / MBq	D_{ij} / MBq	U_{ij} / MBq
BIPM	0.6	1.6							0.2	1.6	-0.1	1.8	1.2	1.8	1.4	2.3
PTB	-0.1	0.3	-0.7	1.6			-0.2	0.6	-0.5	0.6	-0.8	0.9	0.5	1.0	0.7	1.7
IRMM	0.1	0.3	-0.5	1.6	0.2	0.6			-0.3	0.6	-0.6	0.8	0.7	1.0	0.9	1.7
LNE-LNHB	0.4	0.5	-0.2	1.6	0.5	0.6	0.3	0.6			-0.3	0.9	1.0	1.0	1.2	1.7
CIEMAT	0.7	0.8	0.1	1.8	0.8	0.9	0.6	0.8	0.3	0.9			1.3	1.2	1.5	1.8
NPL	-0.6	0.9	-1.2	1.8	-0.5	1.0	-0.7	1.0	-1.0	1.0	-1.3	1.2			0.2	1.9
NRC	-0.8	1.7	-1.4	2.3	-0.7	1.7	-0.9	1.7	-1.2	1.7	-1.5	1.8	-0.2	1.9		

BIPM.RI(II)-K1.Np-237 and 1998 EUROMET.RI(II)-K2.Np-237
Degrees of equivalence for equivalent activity of ²³⁷Np



Red diamonds : participants in BIPM.RI(II)-K1.Np-237
Green triangles : participants in EUROMET.RI(II)-K2.Np-237
 Note: The right-hand axis shows approximate relative values only