Discussion

Comparisons of ^{67}Ga and ^{201}Tl

Details

- Gallium-67
  - 3.2613 (5) d
  - 100% EC
  - 184.576 keV γ
  - Hodgkin's disease
  - Lymphoma
  - Bronchogenic Cacinoma
  - Infection Imaging
- Thallium-201
  - 3.0421 (17) d
  - 100% EC
  - 167.45 keV γ
  - Myocardial Perfusion Imaging

Key comparison BIPM.RI(II)-K1.Ga-67

MEASURAND : Equivalent activity of ^{67}Ga

Key comparison reference value: the SIR reference value for this radionuclide x_R is 116.2 MBq, with a standard uncertainty u_R of 0.6 MBq (see Final Report updated in June 2006).

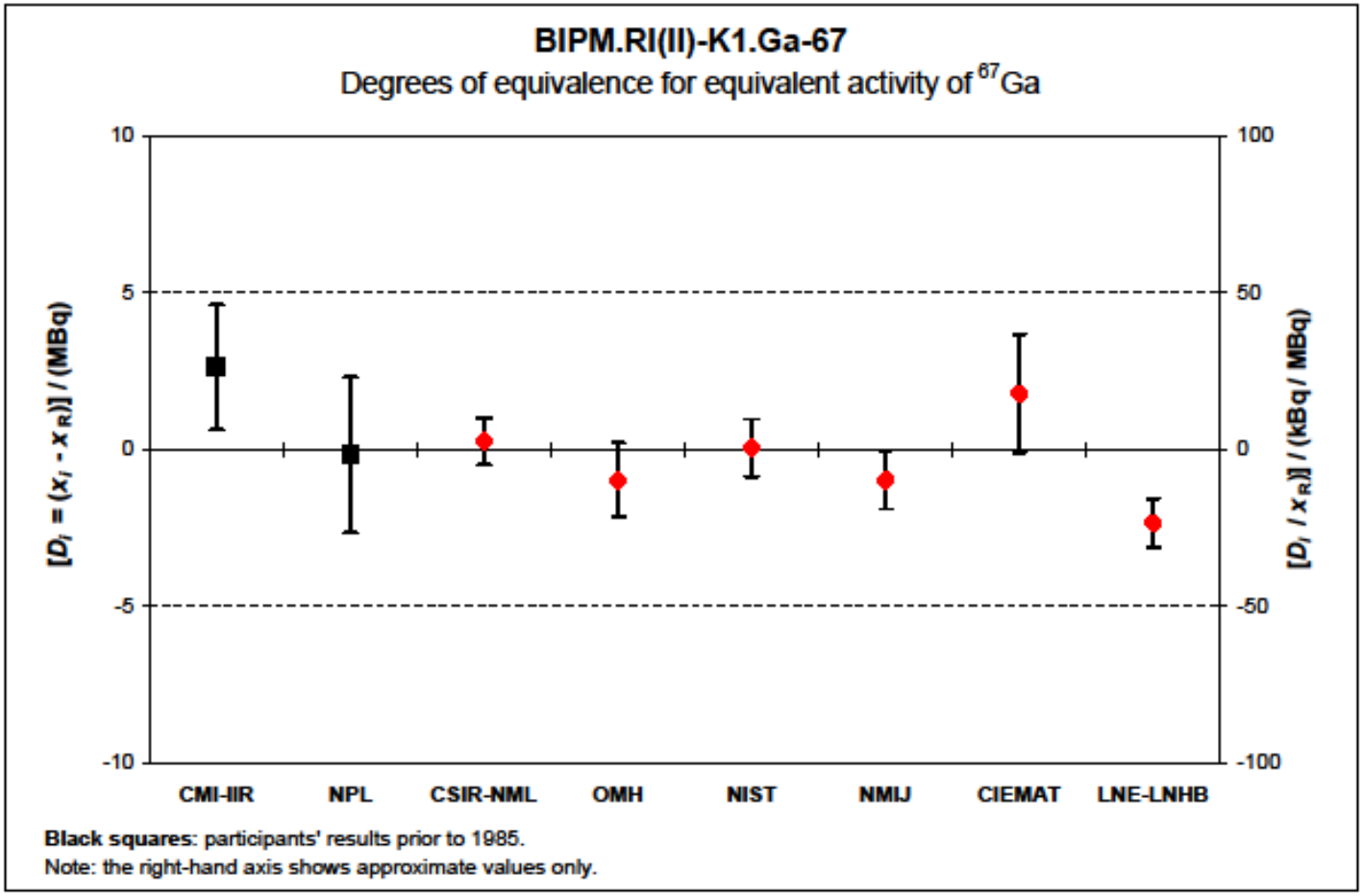
The degree of equivalence of each laboratory with respect to the reference value is given by a pair of terms:
$D_i = (x_i - x_R)$ and U_i, its expanded uncertainty ($k = 2$), both expressed in MBq. With n the number of laboratories,
$U_i = 2[(1 - 2/n)u_i^2 + (1/n^2)\Sigma u_i^2]^{1/2}$ when each laboratory has contributed to the computation of x_R, see *Metrologia, 42, 140-144*.

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 / MBq	U_i / MBq	CMI-IIR		NPL		CSIR-NML		OMH		NIST		NMIJ		CIEMAT		LNE-LNHB	
			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
CMI-IIR	2.6	2.0			2.8	3.6	2.4	2.3	3.6	2.5	2.6	2.3	3.6	2.4	0.8	3.0	5.0	2.3
NPL	-0.2	2.5	-2.8	3.6			-0.4	2.9	0.8	3.0	-0.2	2.9	0.8	2.9	-2.0	3.5	2.2	2.9
CSIR-NML	0.2	0.7	-2.4	2.3	0.4	2.9			1.2	1.3	0.2	0.9	1.2	1.0	-1.5	2.2	2.6	0.9
OMH	-1.0	1.2	-3.6	2.5	-0.8	3.0	-1.2	1.3			-1.0	1.4	0.0	1.5	-2.8	2.4	1.4	1.4
NIST	0.0	0.9	-2.6	2.3	0.2	2.9	-0.2	0.9	1.0	1.4			1.0	1.1	-1.7	2.2	2.4	1.0
NMIJ	-1.0	0.9	-3.6	2.4	-0.8	2.9	-1.2	1.0	0.0	1.5	-1.0	1.1			-2.8	2.3	1.4	1.1
CIEMAT	1.8	1.9	-0.8	3.0	2.0	3.5	1.5	2.2	2.8	2.4	1.7	2.2	2.8	2.3			4.1	2.2
LNE-LNHB	-2.4	0.8	-5.0	2.3	-2.2	2.9	-2.6	0.9	-1.4	1.4	-2.4	1.0	-1.4	1.1	-4.1	2.2		


BIPM.RI(II)-K1.Ga-67
Degrees of equivalence for equivalent activity of 67Ga
10
5
0
-5
-10
100
50
0
-50
-100
[Di = (xi - xR)] / (MBq)
[Di / xR)] / (kBq / MBq)
CMI-IIR
NPL
CSIR-NML
OMH
NIST
NMIJ
CIEMAT
LNE-LNHB
Black squares: participants' results prior to 1985.
Note: the right-hand axis shows approximate values only.

Key comparison BIPM.RI(II)-K1.TI-201

MEASURAND : Equivalent activity of ^{201}Tl

Key comparison reference value: the SIR reference value for this radionuclide is x_R = 312.8 MBq with a standard uncertainty u_R = 1.3 MBq.
x_R is computed as the mean of the results obtained by primary methods.

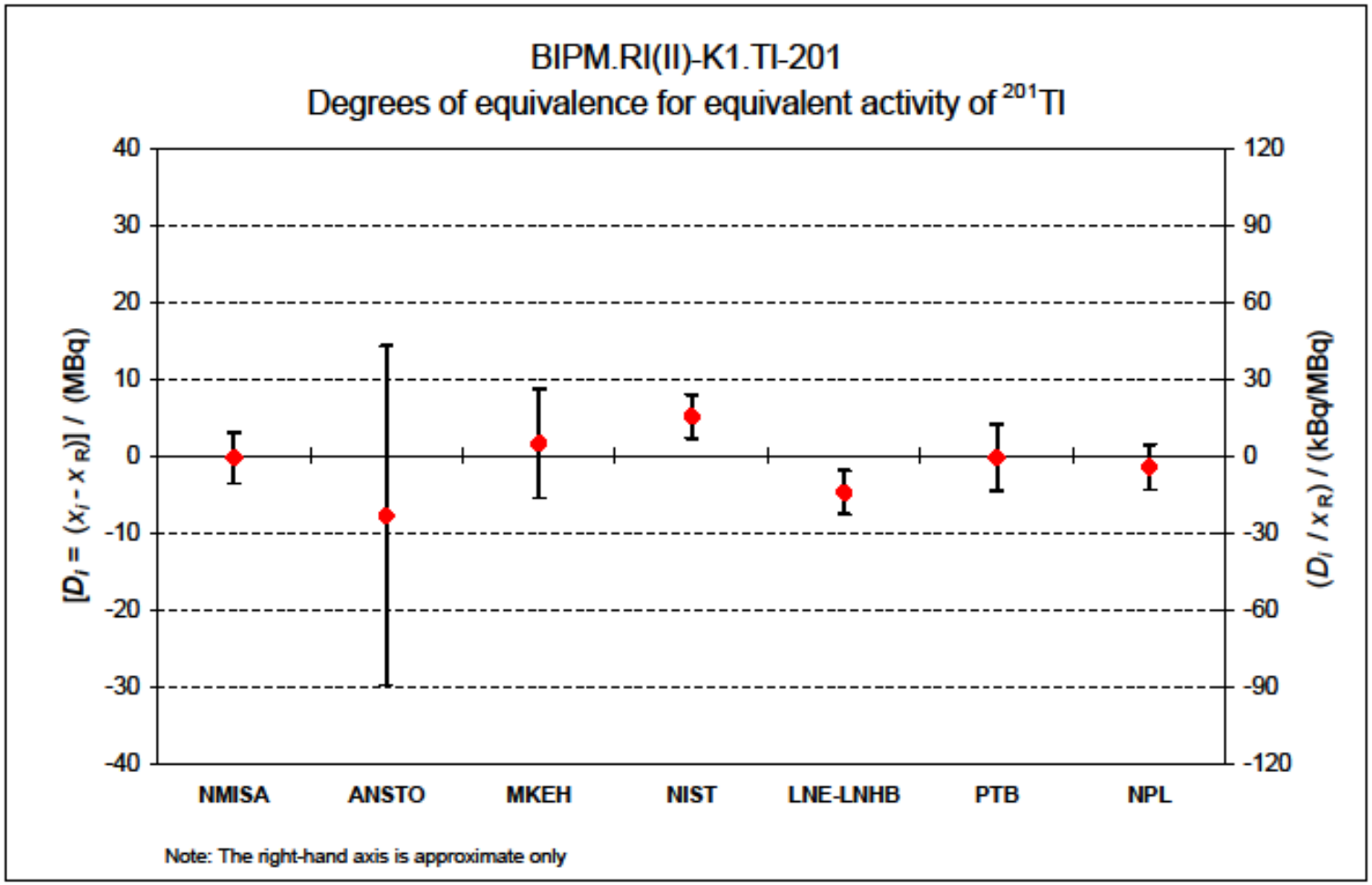
The degree of equivalence of each laboratory with respect to the reference value is given by a pair of terms:
$D_i = (x_i - x_R)$ and U_i, its expanded uncertainty (k = 2), both expressed in MBq, and with n the number of laboratories
$U_i = 2((1 - 2/n)u_i^2 + (1/n^2)\Sigma u_i^2)^{1/2}$ when each laboratory has contributed to the reference value (see Final Report dated 21 April 2008)

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 / MBq	U_i / MBq	NMISA D_{ij} / MBq	NMISA U_{ij} / MBq	ANSTO D_{ij} / MBq	ANSTO U_{ij} / MBq	MKEH D_{ij} / MBq	MKEH U_{ij} / MBq	NIST D_{ij} / MBq	NIST U_{ij} / MBq	LNE-LNHB D_{ij} / MBq	LNE-LNHB U_{ij} / MBq	PTB D_{ij} / MBq	PTB U_{ij} / MBq	NPL D_{ij} / MBq	NPL U_{ij} / MBq
NMISA	-0.3	3.3			7.5	22.3	-1.9	9.1	-5.4	4.3	4.5	4.3	0.0	5.9	1.2	4.4
ANSTO	-7.8	22.1	-7.5	22.3			-9.4	23.5	-12.9	22.2	-3.0	22.2	-7.5	22.5	-6.3	22.2
MKEH	1.6	7.1	1.9	9.1	9.4	23.5			-3.5	8.8	6.4	8.8	1.9	9.7	3.1	8.9
NIST	5.1	2.8	5.4	4.3	12.9	22.2	3.5	8.8			9.9	3.7	5.4	5.5	6.6	3.8
LNE-LNHB	-4.8	2.8	-4.5	4.3	3.0	22.2	-6.4	8.8	-9.9	3.7			-4.5	5.5	-3.3	3.8
PTB	-0.3	4.3	0.0	5.9	7.5	22.5	-1.9	9.7	-5.4	5.5	4.5	5.5			1.2	5.6
NPL	-1.5	3.0	-1.2	4.4	6.3	22.2	-3.1	8.9	-6.6	3.8	3.3	3.8	-1.2	5.6		


BIPM.RI(II)-K1.Tl-201
Degrees of equivalence for equivalent activity of ^{201}Tl
$[D_i = (x_i - x_R)]$ / (MBq)
(D_i / x_R) / (kBq/MBq)
40
30
20
10
0
-10
-20
-30
-40
120
90
60
30
0
-30
-60
-90
-120
NMISA
ANSTO
MKEH
NIST
LNE-LNHB
PTB
NPL
Note: The right-hand axis is approximate only