BUREAU INTERNATIONAL DES POIDS ET MESURES

International Reference System
for activity measurements of gamma-ray emitting nuclides (SIR) (in solution)

Participating laboratory: _

Radionuclide (main contribution) [ ] $T_{1/2}$: _ _ _ _ _ _

Chemical composition of the solution:

Solvent: _ _ _ _ _ _ _ and its concentration: _ _ _ _ _ _ _ mol per dm^3 of solution

Carrier: _ _ _ _ _ _ _ _ and its concentration: _ _ _ _ _ _ _ μg per g of solution

Density of the solution: _ _ _ _ _ _ _ g cm^{-3}

Ampoule number: _ _ _ _ _ _ _ Mass of solution (corrected for buoyancy): _ _ _ _ _ _ _ g

Activity per gram of solution (main radionuclide): _ _ _ _ _ _ _ Bq g^{-1}

Reference date: _ _ _ _ year _ _ _ _ month _ _ _ _ day _ _ _ _ h UTC*

Measurement date: _

Uncertainties (in the form of standard uncertainties). **Please attach also a detailed uncertainty budget** :
Category A (evaluated applying statistical methods): _ _ _ _ Bq g^{-1}; _ _ _ _%

Number of degrees of freedom: _ _ _ _ _

Category B (evaluated by other means): _ _ _ _ Bq g^{-1}; _ _ _ _%

Method(s) of measurement: _

For relative methods, please indicate the primary methods and the standards used to calibrate your experimental setup : _
_ _
the date of calibration :_ _
and also the date of the primary measurement :_ .

	Nuclide	Ratio of activity of impurity to activity of main radionuclide at reference date
Radionuclide impurities :	_ _ _ _ _	(_ _ _ _ _) %; u = (_ _ _ _ _) %
	_ _ _ _ _	(_ _ _ _ _) %; u = (_ _ _ _ _) %

Remarks: _

This sample has been sent in the frame of a pilot study _ _ or to generate an equivalence value _ _.

Date: _ _ _ _ _ _ _ _ Name of person responsible: _ _ _ _ _ _ _ _ _ _ _ _ _ _

Name of person(s) who carried out the measurements: _ _ _ _ _ _ _ _ _ _ _ _ _ _

*UTC = coordinated universal time

Detailed Uncertainty Budget

Laboratory: _ _ _ _ _ _ _ _ _; Radionuclide: _ _ _ _ _ _ _ _ ; Ampoule number: _ _ _ _ _ _ _ .

*Uncertainty components**, in % of the activity concentration, due to

		Remarks	Evaluation type (A or B)	Relative Sensitivity Factor
counting statistics	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
weighing	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
dead time	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
background	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _	_ _ _ _ _ _ _
pile-up	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
counting time	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _
adsorption	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
impurities	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
tracer	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
input parameters and statistical model	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
quenching	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
interpolation from calibration curve	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
decay-scheme parameters	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
half life ($T_{1/2}$ = _ _ _ _ _ ; u= _ _ _ _ _)	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
self absorption	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
extrapolation of efficiency curve	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
other effects (if relevant) (explain)	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _
combined uncertainty (as quadratic sum of all uncertainty components)	_ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _	_ _ _ _ _ _ _

* The uncertainty components are to be considered as approximations of the corresponding standard deviations (see also *Metrologia*, 1981, **17**, 73 and *Guide to expression of uncertainty in measurement*, ISO, corrected and reprinted 1995).

List of acronyms proposed to be used to identify different measurement methods

Each acronym has six components, geometry-detector (1)-radiation (1)-detector (2)-radiation (2)-mode. When a component is unknown, ?? is used and when it is not applicable 00 is used.

Geometry	**acronym**	**Detector**	**acronym**
4π	4P	proportional counter	PC
defined solid angle	SA	press. prop. counter	PP
2π	2P	liquid scintillation counting	LS
undefined solid angle	UA	NaI(Tl)	NA
		Ge(HP)	GH
		Ge(Li)	GL
		Si(Li)	SL
		CsI(Tl)	CS
		ionization chamber	IC
		grid ionization chamber	GC
		bolometer	BO
		calorimeter	CA
		PIPS detector	PS
Radiation	**acronym**	**Mode**	**acronym**
positron	PO	efficiency tracing	ET
beta particle	BP	internal gas counting	IG
Auger electron	AE	CIEMAT/NIST	CN
conversion electron	CE	sum counting	SC
mixed electrons	ME	coincidence	CO
bremsstrahlung	BS	anti-coincidence	AC
gamma rays	GR	coincidence counting with efficiency tracing	CT
X - rays	XR	anti-coincidence counting with efficiency tracing	AT
photons (x + γ)	PH	triple-to-double coincidence ratio counting	TD
photons + electrons	PE	selective sampling	SS
alpha - particle	AP	high efficiency	HE
mixture of various radiations	MX	digital coincidence counting	DC

Examples	
method	**acronym**
4π(PC)β–γ-coincidence counting	4P-PC-BP-NA-GR-CO
4π(PPC)β–γ-coincidence counting eff. trac.	4P-PP-MX-NA-GR-CT
defined solid angle α-particle counting with a PIPS detector	SA-PS-AP-00-00-00
4π(PPC)AX-γ(GeHP)-anticoincidence counting	4P-PP-MX-GH-GR-AC
4π CsI-β,AX,γ counting	4P-CS-MX-00-00-HE
calibrated IC	4P-IC-GR-00-00-00
internal gas counting	4P-PC-BP-00-00-IG