USTUR 050: Radiochemical Analysis Form Description

Purpose	Description and usage of the Radiochemical Analysis Form	**Method Number**	USTUR 050
Original Date	10/10/95	**Author**	USTUR Radiochemistry Staff
Revision Number	2	**Approved By**	James T. Elliston
Effective Date	5/1/00	**Approval Date**	1/31/01

The following procedure describes the meaning of the various quantities which are entered into the Radiochemical Analysis Form for isotopic analysis by alpha spectrometry.

1. Sample Information

1.1. Sample number: sample number as described in USTUR 010. This number is broken into its components of case number and sample number in order to facilitate importing this sheet to a database.

1.2. Element: element to be determined (i.e. Pu, Am, Th, or U).

1.3. Tissue description: description of the sample as provided by the NHRTR, LANL notebook, or type if the sample is a blank or QA/QC.

1.4. Autopsy weight: weight of the total organ if known.

1.5. NHRTR weight: Enter the weight of the sample used for radiochemical analysis. All calculations of concentration will be based on this weight.

1.5.1. This weight is usually the radiochemical weight as provided by the NHRTR.

1.5.2. This weight may also be the weight reported by LANL as the sample weight used for analysis.

1.5.3. This weight may also be the same as the Lab weight (see below) in absence of a weight provided by the NHRTR.

1.6. Lab weight: weight of the radiochemical sample as determined by the radiochemistry staff.

1.6.1. This weight serves as a confirmation that the weight reported by the NHRTR was received by the radiochemistry staff for analysis.

1.6.2. In the event that a gross discrepancy occurs between the provided radiochemical weight or in the event that no radiochemical weight is provided, this weight will serve as the NHRTR weight.

1.7. Ashed weight: weight of the ashed radiochemical sample.

1.8. Solution weight: weight of the solution which the radiochemical sample was dissolved in for analysis.

1.9. Aliquot: weight of the aliquot used for analysis.

2. Tracer Information

2.1. Isotope: the isotope used as tracer.

2.2. Added Activity ± 1 sigma (dpm): the activity of tracer added, uncorrected for decay, and its associated uncertainty. Use an appropriate number of significant figures based on the certificate value.

2.3. Certif. Date: the date the tracer activity was certified.

2.4. Batch: the USTUR control number for the tracer solution used.

2.5. Brnch Rto: the effective branching ratio of the isotope as described in USTUR 600.

2.6. Gross Counts: the gross counts of the isotope in the region of interest (ROI) as determined by alpha spectrometry (USTUR 600).

2.7. Count Time (s): Enter the live time of the sample count in seconds.

2.8. Backgrnd Counts: the background counts in the isotopes' ROI during the background count time. This value will be scaled during the analysis to account for differences in the counting times.

2.9. Bck Cnt Time (s): the live time of the background count in seconds.

2.10. Half-Life (y): the half-life of the tracer isotope in years.

2.11. Date: the date the sample count was begun.

2.12. Initials: the initials of the person who counted the sample.

3. Aliquot Nuclide Information

3.1. Isotope: isotope for determination. The common isotopes for analysis have been placed in predetermined positions to facilitate transfer to a database.

3.2. Gross Cnts: as defined above for the tracer.

3.3. Bckgrnd Cnts: as defined above for the tracer.

3.4. Brnch Rto: as defined above for the tracer.

3.5. Relative Contamination from Tracer (fractional). ± 1 sigma: used for tracers which are contaminated with the isotope of interest. This fraction relates the ratio of the number of counts in the isotopes ROI to the number of counts in the tracer's ROI. See USTUR 600 for further information.

3.6. Activity (dpm): calculated activity and its uncertainty of the isotope in the aliquot. See USTUR 600 for details on the calculation.

3.7. L_d (dpm): calculated decision limit for the isotope. See USTUR 600 for details on the calculation.

3.8. Blank Value (dpm) ± 1 sigma: average isotopic blank value and its uncertainty (standard deviation of the mean).

3.9. Blank Crrctd (dpm) ± 1 sigma: blank corrected isotopic activity of the aliquot and its propagated uncertainty. See USTUR 600 for details on the calculation.

4. TOTAL Sample Information

4.1. Total Activity Radiochemical Sample (Bq): total activity, associated uncertainty, relative standard deviation, and decision limit of the isotope in the radiochemical sample. See USTUR 600 for details on the calculation.

4.2. Wet Concentration (Bq/kg): activity per kg wet weight, associated uncertainty, and decision limit of the isotope. See USTUR 600 for details on the calculation.

4.3. Ash Concentration (Bq/kg): activity per kg ash weight, associated uncertainty, and decision limit of the isotope. See USTUR 600 for details on the calculation

5. Additional Information

5.1. Planchet No.: the number inscribed on the planchet (see USTUR 010)

5.2. Analysis File: the file name for this sample (see USTUR 010).

5.3. Det. Number: the detector number used for the analysis.

5.4. Counter Eff.: the counter efficiency as a fractional value.

5.5. Blank File: the blank run with the sample.

5.6. Recovery: radiochemical recovery of tracer. See USTUR 600 for calculation details.

6. Procedure Information

6.1. Lists the various USTUR procedure methods run, dates performed, initials of chemist, and any additional notes associated with the sample for that procedure.

7. Initial Section

7.1 Received: date sample received.

7.2. Oven Dried: date that the sample was placed in the oven for drying.

7.3. Ashed: date sample placed in muffle furnace for ashing.

7.4. Dissolution: date sample began wet ashing.

7.5. Tracer Add: date and initials of chemist adding tracer to aliquot selected for analysis.

7.6. Tracer Check: date and initials of chemist witnessing spike.

7.7. Electrodep: date electrodeposition performed.

7.8. Counted: date sample count initiated.

7.9. Recounted: date sample recount initiated.

7.10. Reported: date of preparation of control sheet for entry into EXCEL spreadsheet for analysis.

7.11. Verified: date EXCEL spreadsheet validated.

7.12. Archived: date of data entry into EXCEL spreadsheet.

8. Notes Section

8.1. All notes entered on the Sample Control Sheet shall be entered into the Radiochemical Analysis Form to provide information on deviations from procedures or additional information on the analytical procedure.

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May 1, 2000

United States Transuranium and Uranium Registries
Radiochemical Sample Analysis Form

USTUR Case Number: 425
Sample Number: 87
Element Pu

Tracer Information

Isotope	Added Activity (dpm)	± 1 sigma	Certif. Date	Batch	Bmch Rto	Gross Counts	Count Time (s)	Backgrnd Counts	Bck Cnt Time (s)	Half-Life (y)	Date	Initials
Pu-242	8.399	0.03	06/07/1994	utr0023	1.0000	2403	150,000	2	300,000	3.7630E+05	07/27/2000	je

Aliquot Nuclide Information

Isotope	Gross Cts	Bckgrnd Cnts	Bmch Rto	Relative Contamination From Tracer (Fractional)	±1 sigma	Activity (dpm)	±1 sigma	MDA (dpm)	Blnk Value (dpm)	± 1 sigma	Blnk Crrctd (dpm)	± 1 sigma
Pu-238	5	3	1.0000	0.000E+00	0.000E+00	0.0122	0.0084	0.0277	0	0	0.0122	0.0084
Pu-(239+240)	216	3	1.0000	0.000E+00	0.000E+00	0.7500	0.0538	0.0277	0	0	0.7500	0.0538

TOTAL Sample Information

Isotope	Total Activity Radiochemical Sample (Bq)	±1 sigma for total act. (Bq)	RSD (1 sigma)	Total Radiochemical Sample MDA (Bq)	Wet Concentration (Bq/Kg)	±1 sigma for Wet Conc. (Bq)	Wet Concentration MDA (Bq/Kg)	Ash Concentration (Bq/Kg)	±1 sigma for Ash Conc. (Bq)	Ash Concentration MDA (Bq/Kg)	Additional Information
Pu-238	6.5926E-04	4.5188E-04	68.54%	1.4946E-03	4.5782E-02	3.1381E-02	1.0379E-01	8.2202E-02	5.6344E-02	1.8636E-01	Planchet No. 0425087P
Pu-(239+240)	4.0403E-02	2.8967E-03	7.17%	1.4946E-03	2.8058E+00	2.0116E-01	1.0379E-01	5.0378E+00	3.6119E-01	1.8636E-01	Analysis File: 0425087P

Procedure Information

Det. Number: 1

Procedure Number	Date Run	Initials
ustur 150	07/12/2000	dbs
ustur 220	07/20/2000	dbs

Counter Eff.: 0.2467
Blank File: L444
QA/QC File:
Recovery: 46.4%

Notes

2 ml of 0.5 M AlCl3 in 4.5 M HCl added just before column

Dissolution Notes

5/16/00 - Filter.
5/17/00 - KF fusion.
0
0

Tracers added to aliquot:

Tissue Type:	Bone			Date Compl	Initials
Tissue Descr:	Skel - Frontal 2		Received:	12/21/1999	dbs
Autopsy Wght:	na	g	Oven Dried:	01/21/2000	dbs
Radiochem. Wt	14.40	g	Ashed:	01/29/2000	dbs
Lab Weight	14.40	g	Dissolution:	05/18/2000	ged
Ashed Weight:	8.02	g	Tracer Added:	06/26/2000	dbs
Soln Weight:	404.02	g	Tracer Check	06/26/2000	spl
Aliquot Wt:	125.00	g			

Initials		Date	Initials
Electrodep.:	07/25/2000	dbs	
Counted:	07/27/2000	je	
Reported:	08/01/2000	dbs	
Verified:			
Archived	08/11/2000	cg	

Notebook References

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