
***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-1032\UNC-GFLU-10

Report Generated On : 7/6/2017 9:55:08 AM

Sample Title : UNC-GFLU-1032-S-P-2

Sample Description :

Sample Identification : 1032-S-P-2

Sample Type :

Sample Geometry : cylinder

Peak Locate Threshold : 3.00

Peak Locate Range (in channels) : 40 - 8192

Peak Area Range (in channels) : 40 - 8192

Identification Energy Tolerance : 1.000 keV

Sample Size : 2.445E+002 grams

Sample Taken On : 5/30/2017 2:00:00 PM

Acquisition Started : 6/5/2017 3:30:20 PM

Live Time : 1800.0 seconds

Real Time : 1800.4 seconds

Dead Time : 0.02 %

Energy Calibration Used Done On : 4/13/2017

Efficiency Calibration Used Done On : 7/6/2017

Efficiency ID : H-IMC-2002-S-P-5

***** P E A K A N A L Y S I S R E P O R T *****

Detector Name: 8566

Sample Title: UNC-GFLU-1032-S-P-2

Peak Analysis Performed on: 7/6/2017 9:55:04 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
F	1	296-	304	299.13	74.97	0.62	7.52E+001	19.69	8.10E+001
F	2	567-	580	574.64	143.91	0.66	4.01E+001	49.94	7.00E+001
F	3	644-	658	654.41	163.87	0.29	4.95E+001	194.04	4.50E+001
F	4	734-	749	741.71	185.72	0.92	2.60E+002	30.50	5.20E+001
F	5	949-	959	953.63	238.75	0.77	3.02E+001	13.92	3.30E+001
F	6	1399-	1412	1404.42	351.56	1.05	3.94E+001	19.40	2.38E+001
F	7	5824-	5846	5835.30	1460.36	2.35	1.40E+002	24.47	1.28E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

 ***** N U C L I D E I D E N T I F I C A T I O N R E P O R T *****

Sample Title: UNC-GFLU-1032-S-P-2
 Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 NLB 0328201

..... IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.967	1460.82*	10.66	9.48321E+000	1.79170E+000
Pb-212	0.634	74.82*	10.28	6.73287E-001	1.98297E-001
		77.11	17.10		
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	8.71452E-002	4.10918E-002
		300.09	3.30		
PB-214	0.272	74.82*	5.80	1.19334E+000	3.67326E-001
		77.11	9.70		
		86.83	1.70		
		87.35	2.24		
		89.78	0.82		
		241.99	7.25		
		258.76	0.53		
		295.22	18.42		
		351.93*	35.60	2.05417E-001	1.02616E-001
		785.96	1.06		
		839.07	0.58		
Ra-226	0.967	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	7.25545E+000	1.14684E+000

* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 1.000 keV

Nuclide confidence index threshold = 0.10

Errors quoted at 1.960 sigma

 ***** I N T E R F E R E N C E C O R R E C T E D R E P O R T *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/gram)	Wt mean Activity Uncertainty
K-40	0.967	9.483206E+000	1.791703E+000
Pb-212	0.634	1.054293E-001	4.023926E-002
PB-214	0.272	2.698920E-001	9.856448E-002
Ra-226	0.967	7.255448E+000	1.146843E+000
X U-235	0.993		

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.960 sigma

***** U N I D E N T I F I E D P E A K S *****

Peak Locate Performed on: 7/6/2017 9:55:04 AM
 Peak Locate From Channel: 40
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
F 2	143.91	2.2259E-002	124.65	Tol.	U-235
F 3	163.87	2.7486E-002	392.20	Tol.	U-235

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

***** N U C L I D E M D A R E P O R T *****

Detector Name: 8566
Sample Geometry: cylinder
Sample Title: UNC-GFLU-1032-S-P-2
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 NLB 0328201

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram)
+	K-40	1460.82*	10.66	1.382E+000	1.38E+000	9.483E+000	5.995E-00
	Pb-210	46.54	4.25	2.398E+000	2.40E+000	1.936E+000	1.140E+00
	BI-212	727.33	6.67	2.080E+000	2.08E+000	-1.577E+000	9.609E-00
		785.37	1.10	1.288E+001		3.256E+000	5.928E+00
		1078.62	0.56	2.857E+001		-1.409E+001	1.295E+00
		1620.50	1.47	9.740E+000		-7.438E+000	4.143E+00
+	Pb-212	74.82*	10.28	4.435E-001	9.18E-002	6.733E-001	2.096E-00
		77.11	17.10	4.013E-001		1.792E-001	1.935E-00
		86.83	2.07	2.527E+000		9.631E-001	1.209E+00
		87.35	3.97	1.201E+000		-2.236E+000	5.721E-00
		89.78	1.46	2.920E+000		-3.530E+000	1.383E+00
		115.18	0.60	6.531E+000		1.971E+000	3.082E+00
		238.63*	43.60	9.181E-002		8.715E-002	4.200E-00
		300.09	3.30	2.090E+000		-2.291E+000	9.806E-00
	BI-214	76.86	0.55	1.259E+001	3.43E-001	3.674E+000	6.073E+00
		79.29	0.91	5.670E+000		-2.210E+000	2.703E+00
		609.32	45.49	3.433E-001		2.923E-001	1.619E-00
		665.45	1.53	9.401E+000		2.638E+000	4.384E+00
		768.36	4.89	3.197E+000		1.197E+000	1.485E+00
		806.18	1.26	1.208E+001		2.133E+000	5.581E+00
		934.06	3.11	5.663E+000		-6.304E-001	2.618E+00
		1120.29	14.92	1.442E+000		3.940E-001	6.692E-00
		1155.21	1.63	1.260E+001		2.186E+000	5.811E+00
		1238.11	5.83	3.917E+000		-1.071E+000	1.814E+00
		1280.98	1.43	1.245E+001		-5.831E+000	5.619E+00
		1377.67	3.99	4.211E+000		5.818E-001	1.873E+00
		1385.31	0.79	2.128E+001		-3.518E+000	9.465E+00
		1401.52	1.33	1.428E+001		-6.762E+000	6.431E+00
		1407.99	2.39	7.430E+000		-2.768E+000	3.321E+00
		1509.21	2.13	7.998E+000		-4.059E+000	3.528E+00
		1583.20	0.70	2.338E+001		-4.082E+000	1.020E+00
		1661.27	1.05	1.343E+001		-3.547E+000	5.673E+00
		1729.59	2.88	5.855E+000		-1.746E-001	2.534E+00
		1764.49	15.30	1.549E+000		1.618E+000	6.988E-00
		1847.43	2.03	9.384E+000		3.654E+000	4.096E+00
>		2118.51	1.16	0.000E+000		0.000E+000	0.000E+00
>		2204.06	4.92	0.000E+000		0.000E+000	0.000E+00
>		2447.70	1.55	0.000E+000		0.000E+000	0.000E+00
+	PB-214	74.82*	5.80	7.860E-001	1.44E-001	1.193E+000	3.715E-00
		77.11	9.70	7.074E-001		3.159E-001	3.411E-00
		86.83	1.70	3.078E+000		1.173E+000	1.472E+00
		87.35	2.24	2.129E+000		-3.964E+000	1.014E+00

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram)
+	PB-214	89.78	0.82	5.199E+000	1.44E-001	-6.286E+000	2.462E+00
		241.99	7.25	9.539E-001		-4.874E-001	4.532E-00
		258.76	0.53	1.185E+001		-4.859E-001	5.581E+00
		295.22	18.42	4.021E-001		1.522E-001	1.897E-00
		351.93*	35.60	1.438E-001		2.054E-001	6.484E-00
		785.96	1.06	1.327E+001		2.992E+000	6.098E+00
		839.07	0.58	3.068E+001		2.180E+001	1.431E+00
+	Ra-226	81.07	0.20	2.351E+001	1.22E+000	6.528E+000	1.115E+00
		83.79	0.32	1.685E+001		8.399E+000	8.069E+00
		186.21*	3.64	1.222E+000		7.255E+000	5.733E-00
	AC-228	89.96	1.90	3.273E+007	9.65E+006	-6.256E+007	1.556E+00
		93.35	3.10	2.078E+007		3.429E+006	9.901E+00
		99.51	1.26	3.673E+007		-1.446E+007	1.718E+00
		105.60	0.74	7.310E+007		2.895E+007	3.454E+00
		129.07	2.42	2.157E+007		4.386E+006	1.015E+00
		153.98	0.72	8.302E+007		1.419E+007	3.922E+00
		209.25	3.89	1.815E+007		-2.516E+007	8.545E+00
		214.85	0.76	9.604E+007		6.560E+007	4.524E+00
		270.24	3.46	2.459E+007		1.987E+007	1.154E+00
		328.00	2.95	3.576E+007		9.571E+006	1.680E+00
		338.32	11.27	9.724E+006		6.577E+006	4.570E+00
		409.46	1.92	6.179E+007		-3.374E+007	2.880E+00
		463.00	4.40	3.199E+007		6.531E+006	1.496E+00
		562.50	0.87	1.610E+008		-5.340E+007	7.408E+00
		674.75	2.10	8.977E+007		2.589E+007	4.170E+00
		726.86	0.62	3.075E+008		-2.525E+008	1.422E+00
		755.32	1.00	1.959E+008		1.147E+008	9.049E+00
		772.29	1.49	1.403E+008		5.627E+007	6.503E+00
		794.95	4.25	3.768E+007		-3.975E+007	1.700E+00
		830.49	0.54	4.207E+008		4.313E+008	1.953E+00
		835.71	1.61	1.465E+008		-7.180E+007	6.815E+00
		840.38	0.91	2.663E+008		1.110E+008	1.241E+00
		904.20	0.77	2.970E+008		-2.820E+008	1.371E+00
		911.20	25.80	9.649E+006		2.747E+006	4.482E+00
		964.77	4.99	5.612E+007		4.807E+007	2.620E+00
		968.97	15.80	1.742E+007		1.238E+007	8.118E+00
		1247.08	0.50	5.567E+008		2.784E+007	2.552E+00
		1459.14	0.83	7.591E+008		1.847E+009	3.635E+00
		1495.91	0.86	2.415E+008		8.803E+007	1.050E+00
		1588.20	3.22	7.883E+007		4.192E+006	3.498E+00
		1630.63	1.51	1.608E+008		1.791E+006	7.071E+00
	TH-230	67.67	0.38	1.322E+001	1.32E+001	-6.652E-001	6.251E+00
	PA-234	742.81	0.11	1.340E+002	2.05E+001	-1.766E+002	6.194E+00
		766.42	0.32	5.079E+001		4.242E+001	2.365E+00
		1001.03	0.84	2.053E+001		4.558E+000	9.427E+00
	TH-234	63.29	3.70	1.627E+000	1.63E+000	1.878E+000	7.735E-00
		92.38	2.13	2.308E+000		2.146E+000	1.102E+00
		92.80	2.10	2.285E+000		9.401E-001	1.090E+00
		112.81	0.21	1.706E+001		-9.043E+000	8.007E+00
	U-234	53.20	0.12	5.013E+001	5.01E+001	3.646E+001	2.351E+00
		120.90	0.04	1.116E+002		4.492E+001	5.263E+00

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram)
U-235	89.96	3.43	1.331E+000	3.83E-001	-2.543E+000	6.325E-00
	93.35	5.54	8.532E-001		1.408E-001	4.066E-00
	104.82	0.69	5.516E+000		-4.749E+000	2.599E+00
	105.60	1.31	3.030E+000		1.200E+000	1.432E+00
	108.58	0.50	7.515E+000		-1.720E+000	3.539E+00
	109.19	1.66	2.252E+000		9.231E-001	1.060E+00
	143.76*	10.96	3.826E-001		3.170E-001	1.806E-00
	163.36*	5.08	7.357E-001		9.071E-001	3.430E-00
	194.94	0.63	8.279E+000		-8.368E-002	3.913E+00
	202.12	1.08	5.133E+000		3.204E+000	2.430E+00
	205.32	5.02	1.133E+000		4.464E-001	5.370E-00

+ = Nuclide identified during the nuclide identification

* = Energy line found in the spectrum

> = MDA value not calculated

@ = Half-life too short to be able to perform the decay correction

 *** LINE ACTIVITY CONSISTENCY EVALUATOR ***

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 Analysis using Key Line Activities
 =====

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-1032\UNC-GFLU-10

Equation used to calculate plot: $\ln(\text{Ratio}) = A + B \cdot \ln(\text{Energy})$
 where: Ratio = Activity/KL Activity

Notes:

'^' Denotes Key Line energy

* All uncertainties quoted at 1.96 sigma

Nuclide	Energy (keV)		Activity (pCi/gram)	Activity %Uncert*	Ratio[%Uncert]	A	B [uncert]
-----	-----		-----	-----	-----	-----	-----
K-40	1460.8	^	9.48E+000	18.893			
Pb-212	74.8		6.73E-001	29.452	7.726[55.596]	9.65	-1.763
	238.6	^	8.71E-002	47.153	1.000[66.685]		[0.749]
PB-214	74.8		1.19E+000	30.781	5.809[58.677]	6.66	-1.136
	351.9	^	2.05E-001	49.955	1.000[70.647]		[0.593]
Ra-226	186.2	^	7.26E+000	15.807			