
***** 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-2198\UNC-IMC-219

Report Generated On : 5/4/2017 8:15:20 AM

Sample Title : UNC-IMC-2198-S-P-8

Sample Description :

Sample Identification : IMC-2198-S-P-8

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 : 3.764E+002 grams

Sample Taken On : 4/10/2017 12:00:00 AM

Acquisition Started : 4/21/2017 12:25:34 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 : 5/4/2017

Efficiency ID : H-IMC-2189-S-P-8

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

Detector Name: 8566

Sample Title: UNC-IMC-2198-S-P-8

Peak Analysis Performed on: 5/4/2017 8:15:16 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	183-	190	186.12	46.69	0.59	6.19E+001	18.88	8.13E+001
M	2	284-	314	291.25	72.99	0.75	1.03E+002	23.44	1.86E+002
m	3	284-	314	299.54	75.07	0.76	2.19E+002	30.10	2.07E+002
m	4	284-	314	308.38	77.28	0.76	8.02E+001	21.77	1.83E+002
F	5	330-	342	336.87	84.41	0.95	2.74E+002	113.51	1.54E+002
F	6	356-	365	359.39	90.05	0.66	8.73E+001	21.25	1.03E+002
F	7	367-	379	372.89	93.43	0.76	1.50E+002	86.90	1.34E+002
F	8	568-	582	574.21	143.80	0.99	3.18E+002	45.59	1.09E+002
F	9	649-	659	652.38	163.37	0.84	1.18E+002	23.57	7.84E+001
F	10	733-	750	741.80	185.74	0.93	1.35E+003	68.38	1.01E+002
F	11	816-	828	820.17	205.35	0.83	9.56E+001	21.58	5.85E+001
F	12	948-	957	952.48	238.46	0.71	7.40E+001	19.02	3.25E+001
F	13	1171-	1183	1178.24	294.96	0.81	2.81E+001	38.82	3.51E+001
F	14	1400-	1412	1404.31	351.53	0.80	4.30E+001	15.47	2.86E+001
F	15	5821-	5849	5834.69	1460.21	2.94	1.60E+002	25.59	8.06E+000

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-IMC-2198-S-P-8
 Nuclide Library Used: C:\GENIE2K\CAMFILES\GE_UNC_U-NLB.NLB

..... IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.942	1460.82*	10.66	8.19097E+000	1.48686E+000
U-235	1.000	105.60	1.31		
		109.19	1.66		
		143.76*	10.96	2.00242E+000	4.88928E-001
		163.36*	5.08	1.71047E+000	4.67737E-001
		202.12	1.08		
		205.32*	5.02	1.64344E+000	4.53377E-001

* = 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	0.942	8.190967E+000	1.486858E+000
U-235	1.000	1.776199E+000	2.709734E-001

? = 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: 5/4/2017 8:15:16 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 1	46.69	3.4371E-002	30.52		
M 2	72.99	5.7246E-002	22.75		
m 3	75.07	1.2191E-001	13.72		
m 4	77.28	4.4551E-002	27.14		
F 5	84.41	1.5198E-001	41.49		
F 6	90.05	4.8477E-002	24.36		
F 7	93.43	8.3145E-002	58.06	Tol.	TH-234
F 10	185.74	7.4731E-001	5.08		
F 12	238.46	4.1121E-002	25.70		
F 13	294.96	1.5615E-002	138.10		
F 14	351.53	2.3900E-002	35.96		

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-IMC-2198-S-P-8
Nuclide Library Used: C:\GENIE2K\CAMFILES\GE_UNC_U-NLB.NLB

	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	9.134E-001	9.13E-001	8.191E+000	3.872E-00
	PA-234	742.81	0.11	1.020E+002	1.43E+001	2.845E+001	4.713E+00
		766.42	0.32	3.752E+001		-4.887E+000	1.742E+00
		1001.03	0.84	1.429E+001		-1.376E+001	6.504E+00
	TH-234	63.29	3.70	1.841E+000	1.84E+000	-1.534E-001	8.860E-00
		92.38	2.13	3.286E+000		8.132E+000	1.600E+00
		92.80	2.10	3.148E+000		4.520E+000	1.530E+00
		112.81	0.21	2.316E+001		-2.887E+001	1.116E+00
	U-234	53.20	0.12	7.324E+001	7.32E+001	7.162E+001	3.523E+00
		120.90	0.04	1.420E+002		4.440E+001	6.844E+00
+	U-235	105.60	1.31	3.953E+000	3.84E-001	-3.859E+000	1.909E+00
		109.19	1.66	3.226E+000		-2.058E+000	1.560E+00
		143.76*	10.96	3.835E-001		2.002E+000	1.832E-00
		163.36*	5.08	6.891E-001		1.710E+000	3.250E-00
		202.12	1.08	5.683E+000		-7.643E+000	2.735E+00
		205.32*	5.02	7.474E-001		1.643E+000	3.504E-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
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Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2198\UNC-IMC-219

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]
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K-40	1460.8	^	8.19E+000	18.152			
U-235	143.8	^	2.00E+000	24.417	1.000[34.531]	2.55	-0.521
	163.4		1.71E+000	27.345	0.854[36.660]		[1.406]
	205.3		1.64E+000	27.587	0.821[36.841]		