
***** 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-0011\W6H-IMC-001

Report Generated On : 3/9/2017 3:57:17 PM

Sample Title : W6H-IMC-0011-S-P-3

Sample Description : UNC 2017

Sample Identification : IMC-0011-S-P-3

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 : 4.588E+002 grams

Sample Taken On : 2/28/2017 12:00:00 PM

Acquisition Started : 3/9/2017 3:19:03 PM

Live Time : 1800.0 seconds

Real Time : 1800.6 seconds

Dead Time : 0.03 %

Energy Calibration Used Done On : 3/9/2017

Efficiency Calibration Used Done On : 3/9/2017

Efficiency ID : H-IMC-0011-S-P-3

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

Detector Name: 8381

Sample Title: W6H-IMC-0011-S-P-3

Peak Analysis Performed on: 3/9/2017 3:57:14 PM

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
M	1	296-	312	299.74	74.93	0.60	1.02E+002	23.13	4.30E+001
m	2	296-	312	308.49	77.12	0.61	4.26E+001	17.00	5.48E+001
F	3	738-	748	742.45	185.67	0.67	1.28E+002	24.55	3.85E+001
F	4	948-	957	953.28	238.41	0.92	7.09E+001	19.42	2.50E+001
F	5	2428-	2441	2434.35	608.89	1.31	2.99E+001	13.40	1.52E+001
F	6	5822-	5848	5836.02	1459.81	2.19	1.92E+002	69.51	9.00E+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: W6H-IMC-0011-S-P-3
 Nuclide Library Used: C:\GENIE2K\CAMFILES\GE UNC_b_112211.NLB

..... IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
PB-212	0.906	74.82* @	10.28	6.64203E-001	2.05731E-001
		77.11* @	17.10	1.63238E-001	7.36738E-002
		87.35 @	3.97		
		238.63*	43.60	1.24174E-001	3.98472E-002
BI-214	0.988	300.09	3.30		
		609.32*	45.49	1.12042E-001	5.19916E-002
		665.45 @	1.53		
		768.36	4.89		
		806.18 @	1.26		
		934.22	3.17		
		1120.29	14.92		
		1155.60 @	1.66		
		1238.12	5.83		
		1280.98 @	1.43		
		1377.67	3.99		
		1401.52 @	1.33		
		1407.99	2.39		
		1509.21	2.13		
		1729.59	2.88		
		1764.49	15.30		
		1847.43	2.03		

* = 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
PB-212	@ 0.906	1.241738E-001	3.984723E-002
BI-214	@ 0.988	1.120425E-001	5.199163E-002

? = 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: 3/9/2017 3:57:14 PM
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 3	185.67	7.1342E-002	19.12		
F 6	1459.81	1.0643E-001	36.28		

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: 8381
Sample Geometry: cylinder
Sample Title: W6H-IMC-0011-S-P-3
Nuclide Library Used: C:\GENIE2K\CAMFILES\GE UNC_b_112211.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	2.299E+000	2.30E+000	6.022E+000	1.106E+00
	CO-60	1173.23	99.85	1.055E-001	8.89E-002	-3.199E-002	4.879E-00
		1332.49	99.98	8.888E-002		-5.016E-002	4.011E-00
	CS-137	661.66	85.10	8.475E-002	8.47E-002	6.893E-002	3.946E-00
	BI-212	727.33	6.67	1.246E+000	1.25E+000	2.378E-001	5.828E-00
		785.37	1.10	7.652E+000		3.888E+000	3.567E+00
		1620.50	1.47	6.678E+000		2.880E+000	2.997E+00
+	PB-212	74.82*	10.28	2.169E-001	4.79E-002	6.642E-001	9.960E-00
		77.11*	17.10	1.421E-001		1.632E-001	6.589E-00
		87.35	3.97	6.506E-001		1.513E-001	3.048E-00
		238.63*	43.60	4.794E-002		1.242E-001	2.160E-00
		300.09	3.30	1.276E+000		-4.312E-001	6.001E-00
+	BI-214	609.32*	45.49	8.092E-002	8.09E-002	1.120E-001	3.539E-00
		665.45	1.53	4.586E+000		-1.974E+000	2.130E+00
		768.36	4.89	1.438E+000		2.089E-001	6.615E-00
		806.18	1.26	6.297E+000		1.134E+000	2.918E+00
		934.22	3.17	2.992E+000		-3.304E-001	1.392E+00
		1120.29	14.92	7.639E-001		3.979E-001	3.566E-00
		1155.60	1.66	6.484E+000		-5.292E-001	3.008E+00
		1238.12	5.83	1.988E+000		8.100E-001	9.239E-00
		1280.98	1.43	7.016E+000		2.423E+000	3.216E+00
		1377.67	3.99	2.169E+000		6.065E-001	9.736E-00
		1401.52	1.33	6.923E+000		5.403E-001	3.124E+00
		1407.99	2.39	3.860E+000		-2.317E-001	1.742E+00
		1509.21	2.13	4.045E+000		7.008E-001	1.799E+00
		1729.59	2.88	2.818E+000		-1.101E+000	1.225E+00
		1764.49	15.30	7.756E-001		5.836E-001	3.526E-00
		1847.43	2.03	3.839E+000		9.828E-001	1.644E+00
	PB-214	53.23	1.08	3.176E+000	1.47E-001	7.500E-001	1.453E+00
		74.82	5.80	7.547E-001		-1.970E-001	3.617E-00
		77.11	9.70	3.608E-001		4.387E-002	1.713E-00
		87.09	3.41	7.345E-001		-5.425E-001	3.434E-00
		241.99	7.25	5.217E-001		-7.533E-001	2.464E-00
		295.22	18.42	2.488E-001		-1.352E-002	1.177E-00
		351.93	35.60	1.470E-001		6.745E-002	6.951E-00
		785.96	1.06	8.018E+000		2.065E+000	3.739E+00
	TH-228	240.80	3.97	1.156E+000	1.16E+000	-1.184E+000	5.520E-00
	TH-230	67.67	0.38	8.854E+000	8.85E+000	2.258E+000	4.161E+00
	TH-232	129.07	2.45	8.087E-001	2.71E-001	-4.738E-001	3.733E-00
		209.25	3.88	8.356E-001		-9.257E-001	3.935E-00
		270.24	3.43	1.094E+000		3.865E-001	5.139E-00
		277.35	2.48	1.554E+000		3.294E-001	7.303E-00

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram)
TH-232	327.99	3.06	1.435E+000	2.71E-001	4.823E-001	6.735E-00
	338.32	11.30	3.991E-001		-3.332E-002	1.874E-00
	409.46	1.94	2.635E+000		1.055E+000	1.234E+00
	463.01	4.44	1.341E+000		1.785E-001	6.295E-00
	583.00	30.96	2.712E-001		1.753E-001	1.284E-00
	755.32	1.01	7.663E+000		4.774E-001	3.557E+00
	772.29	1.50	4.564E+000		-1.756E+000	2.094E+00
	794.95	4.34	2.113E+000		8.214E-001	9.901E-00
	835.71	1.68	5.082E+000		2.021E+000	2.362E+00
	860.30	4.32	2.161E+000		-7.517E-003	1.009E+00
	911.21	26.60	3.798E-001		-1.470E-002	1.778E-00
	964.77	5.11	2.068E+000		9.527E-001	9.680E-00
	968.97	16.20	6.155E-001		-2.216E-001	2.869E-00
	1588.21	3.27	2.742E+000		-3.968E-001	1.220E+00
	1630.63	1.60	5.362E+000		1.026E+000	2.366E+00
U-233	42.44	0.06	7.798E+001	7.80E+001	-2.627E+001	3.493E+00
	54.70	0.01	2.119E+002		-4.563E+001	9.608E+00
	97.14	0.02	1.041E+002		2.997E+001	4.851E+00
	146.35	0.01	3.616E+002		4.596E+001	1.684E+00
	164.51	0.01	3.615E+002		-1.378E+002	1.683E+00
	291.32	0.01	7.982E+002		-9.191E+002	3.758E+00
	317.13	0.01	4.642E+002		-6.834E+000	2.173E+00
	320.51	0.00	1.295E+003		3.406E+002	6.053E+00
U-234	53.20	0.12	2.779E+001	2.78E+001	6.561E+000	1.271E+00
	120.90	0.04	5.100E+001		6.739E+000	2.361E+00
U-235	105.60	1.32	1.383E+000	2.16E-001	-8.085E-001	6.338E-00
	109.16	1.54	1.328E+000		6.535E-001	6.148E-00
	143.76	10.96	2.158E-001		2.452E-002	1.008E-00
	163.33	5.08	4.785E-001		1.487E-001	2.232E-00
	202.11	1.08	2.791E+000		-2.385E+000	1.310E+00
	205.31	5.01	6.846E-001		4.114E-002	3.238E-00
U-238	63.29	3.70	9.378E-001	7.26E-001	1.262E-001	4.392E-00
	92.60	4.23	7.260E-001		8.626E-001	3.443E-00
	766.42	0.32	2.239E+001		2.126E+000	1.032E+00
	1001.03	0.84	1.206E+001		7.244E+000	5.617E+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-0011\W6H-IMC-001

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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PB-212	74.8	6.64E-001	30.974	5.349[44.600]	5.46	-1.000
	77.1	1.63E-001	45.133	1.315[55.378]		[0.498]
	238.6 ^	1.24E-001	32.090	1.000[45.382]		
BI-214	609.3 ^	1.12E-001	46.404			