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Pressure leaching characteristics of a magnetically enhanced concentrate with specific refrence to the precious metal components

Craig, Deborah Carol

2008-06-04T10:14:03Z
http://hdl.handle.net/10539/4922

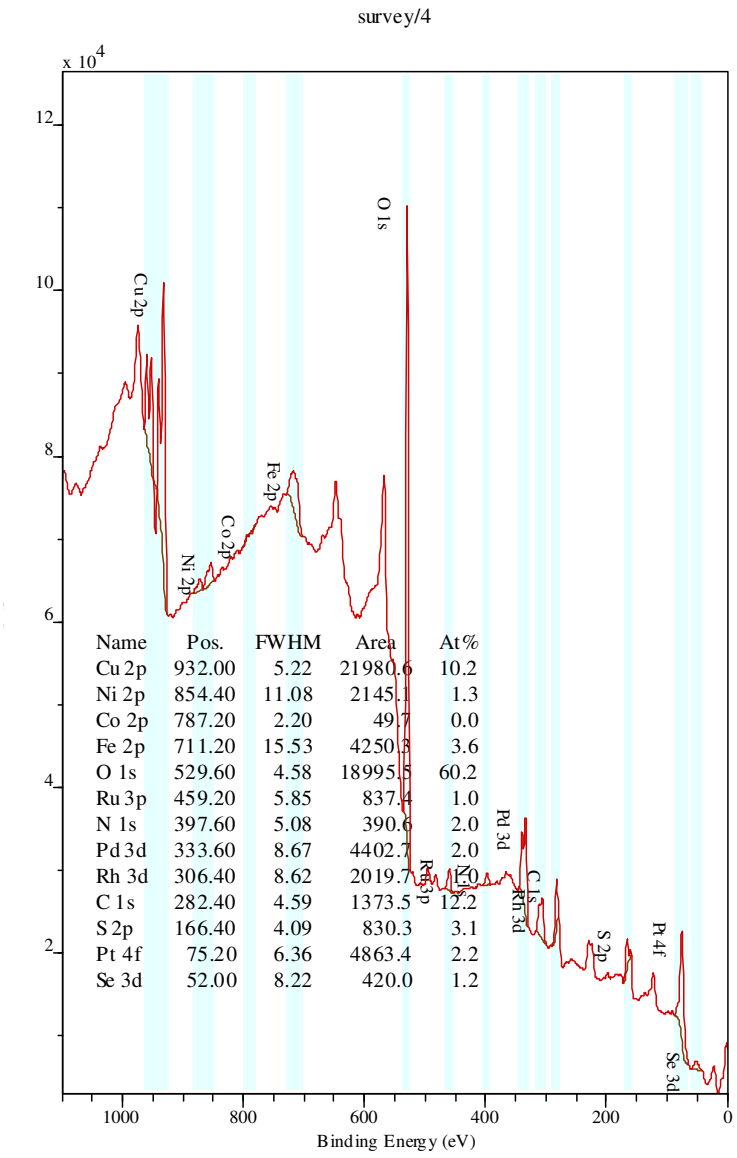
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APPENDIX F

XPS Spectra

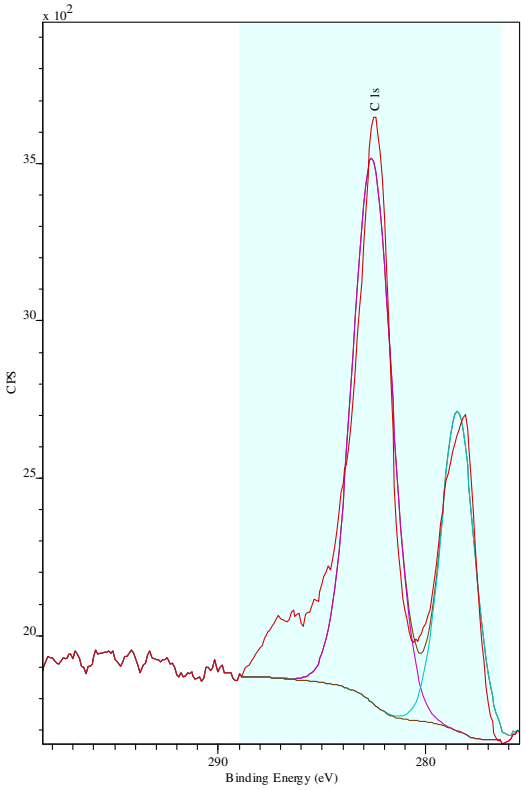
SPECTRA FOR TERTIARY LEACH RUN 2

Atmospheric Leach Residue (ALR)

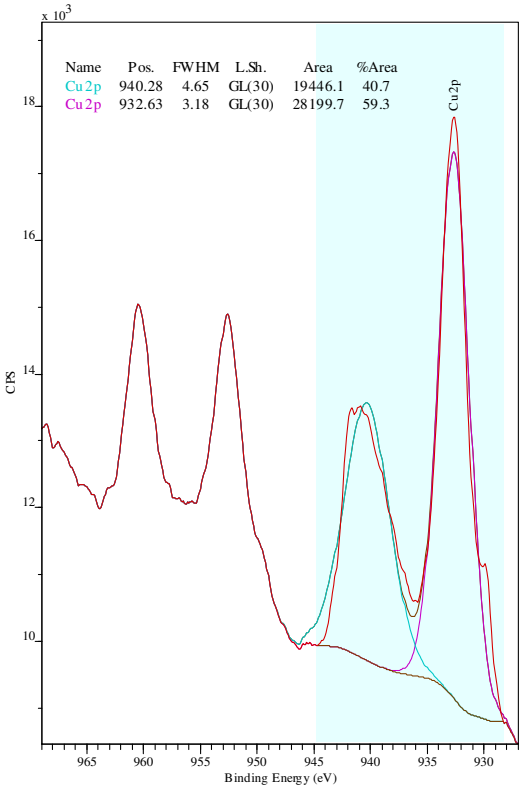


Name	Pos.	FWHM	Area	At%
Cu 2p	932.00	5.22	21980.6	10.2
Ni 2p	854.40	11.08	2145.1	1.3
Co 2p	787.20	2.20	49.7	0.0
Fe 2p	711.20	15.53	4250.3	3.6
O 1s	529.60	4.58	18995.5	60.2
Ru 3p	459.20	5.85	837.4	1.0
N 1s	397.60	5.08	390.6	2.0
Pd 3d	333.60	8.67	4402.7	2.0
Rh 3d	306.40	8.62	2019.7	1.0
C 1s	282.40	4.59	1373.5	12.2
S 2p	166.40	4.09	830.3	3.1
Pt 4f	75.20	6.36	4863.4	2.2
Se 3d	52.00	8.22	420.0	1.2

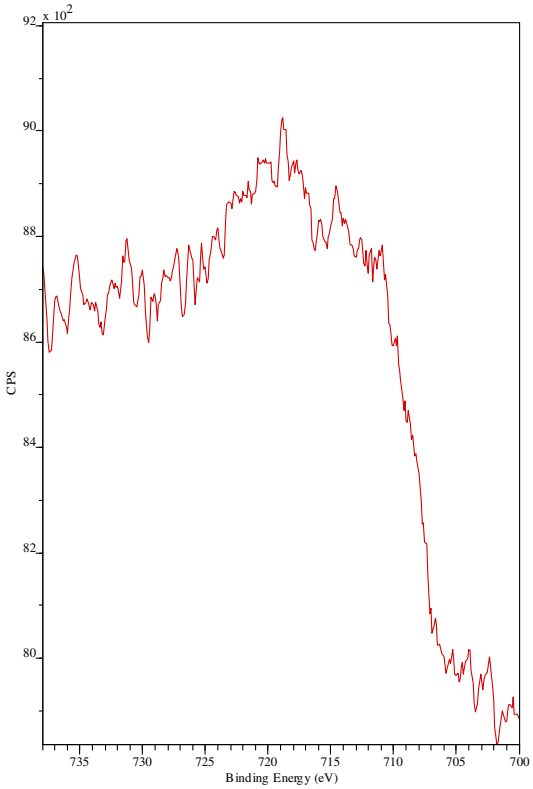
C 1s/20



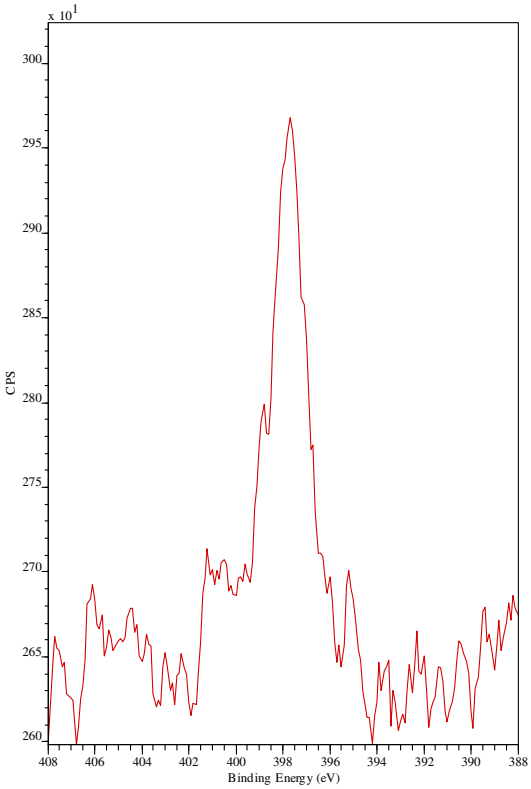
Cu 2p/16

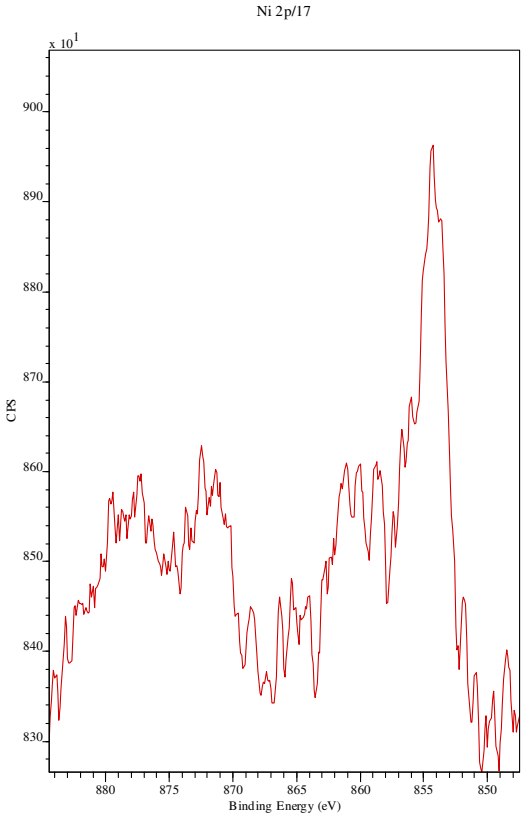


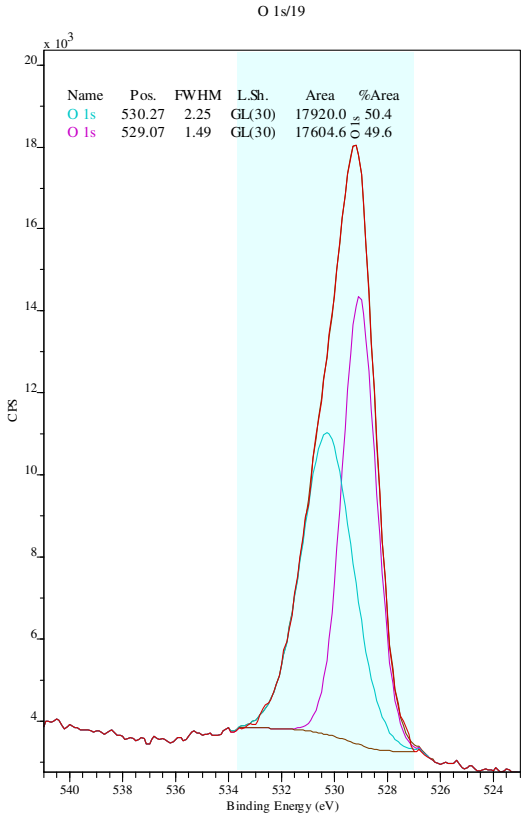
Fe 2p/18

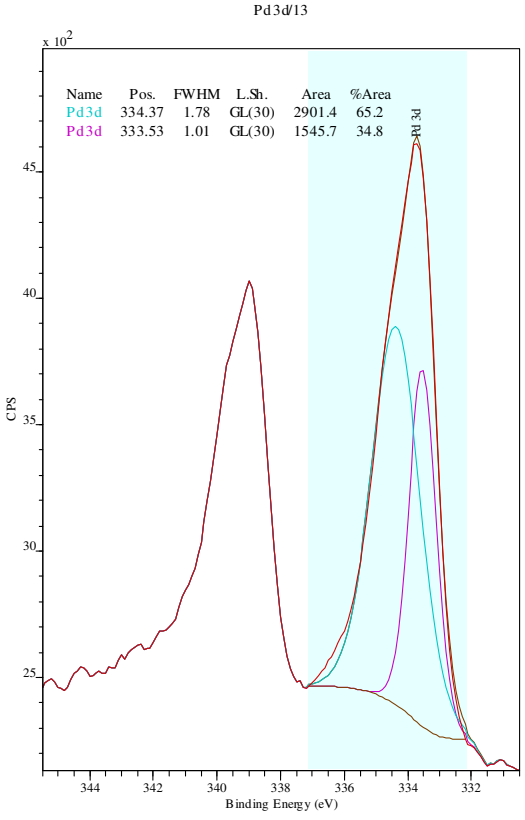


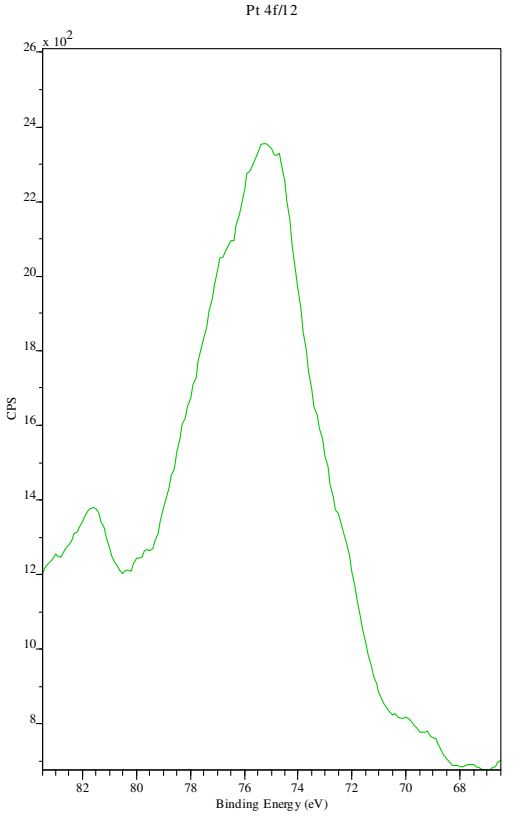
N 1s/22

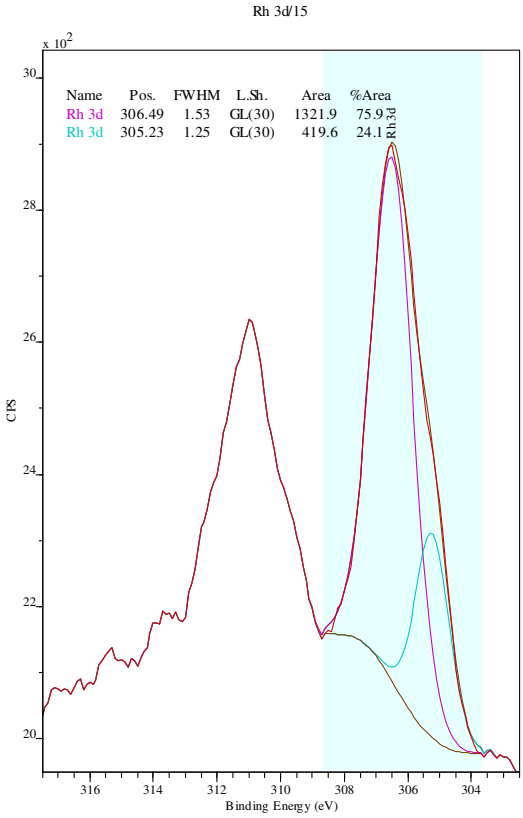


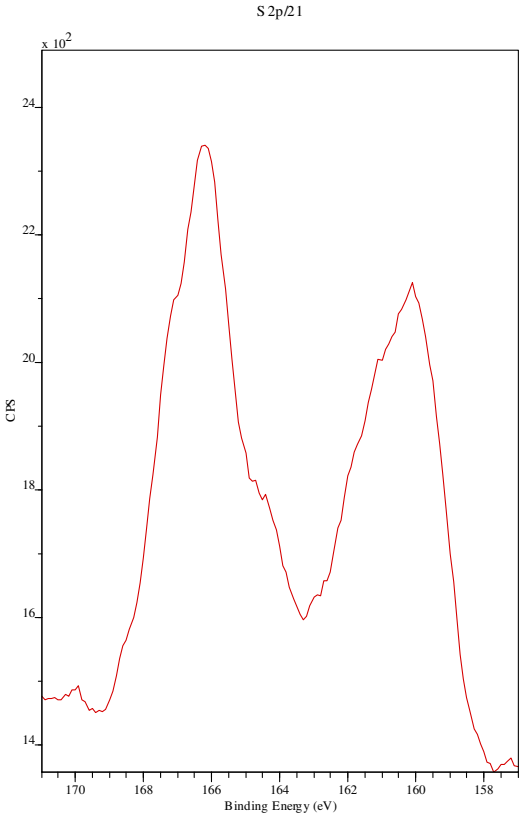

Ni 2p/17
x 10^1
CPS
Binding Energy (eV)


O 1s/19
x 10^3
Name Pos. FWHM L.Sh. Area %Area
O 1s 530.27 2.25 GL(30) 17920.0 50.4
O 1s 529.07 1.49 GL(30) 17604.6 49.6
CPS
Binding Energy (eV)

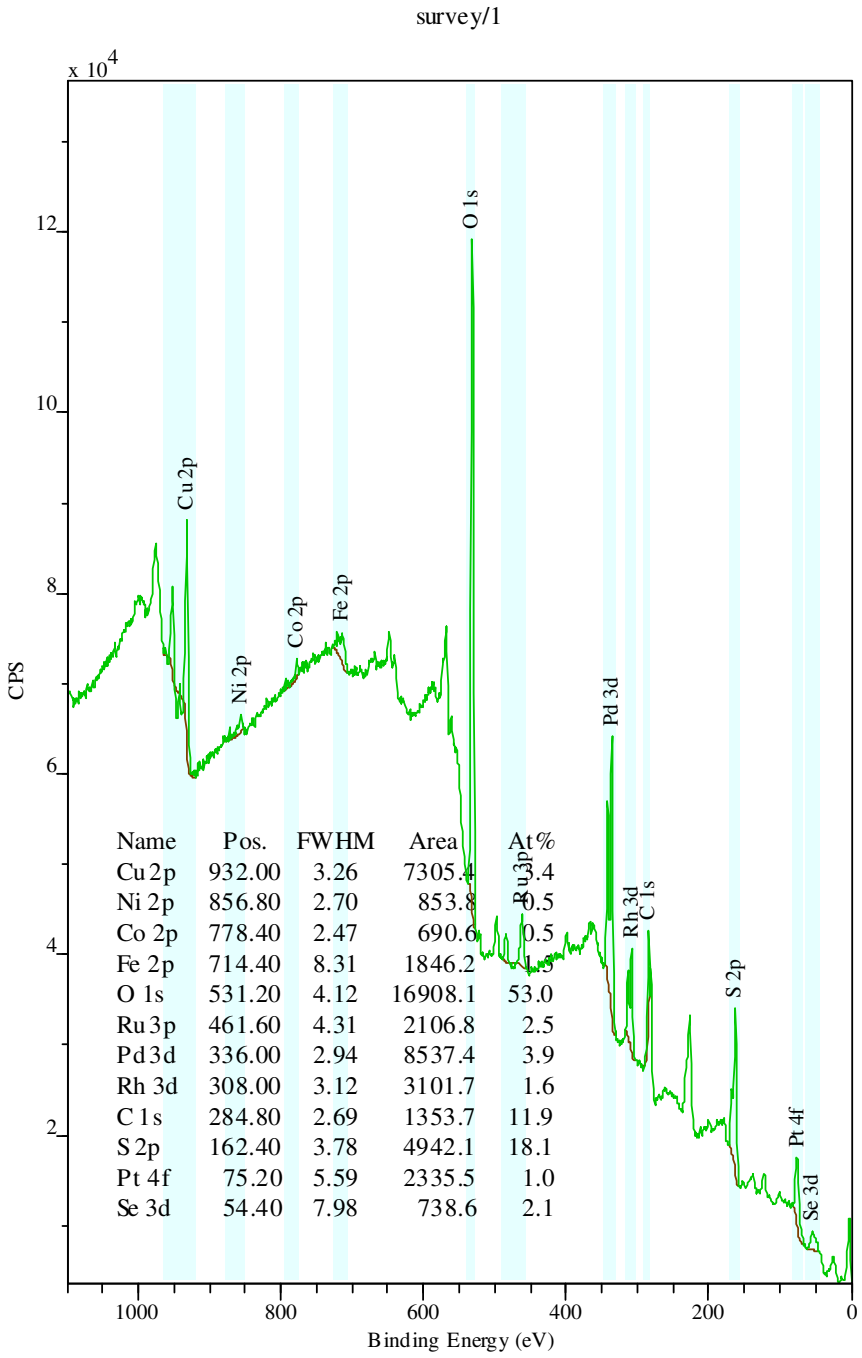

Pd 3d/13
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Pd3d 334.37 1.78 GL(30) 2901.4 65.2
Pd3d 333.53 1.01 GL(30) 1545.7 34.8
Pd 3d
CPS
Binding Energy (eV)


Pt 4f/12
x 10^2
CPS
Binding Energy (eV)

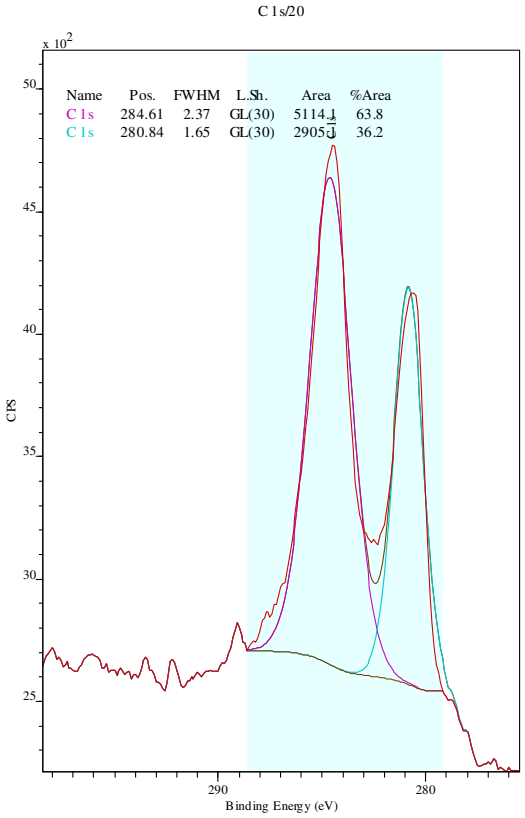

Rh 3d/15
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Rh 3d 306.49 1.53 GL(30) 1321.9 75.9
Rh 3d 305.23 1.25 GL(30) 419.6 24.1
Rh 3d
CPS
Binding Energy (eV)

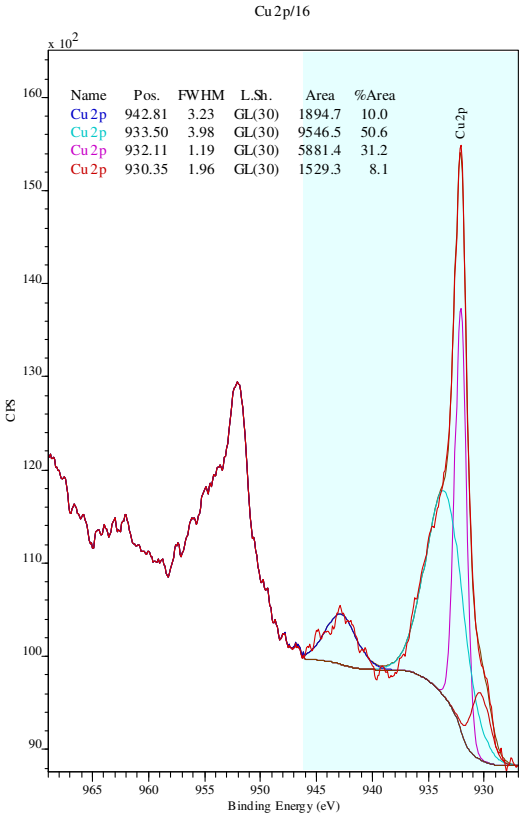

S 2p/21
x 10^2
CPS
Binding Energy (eV)

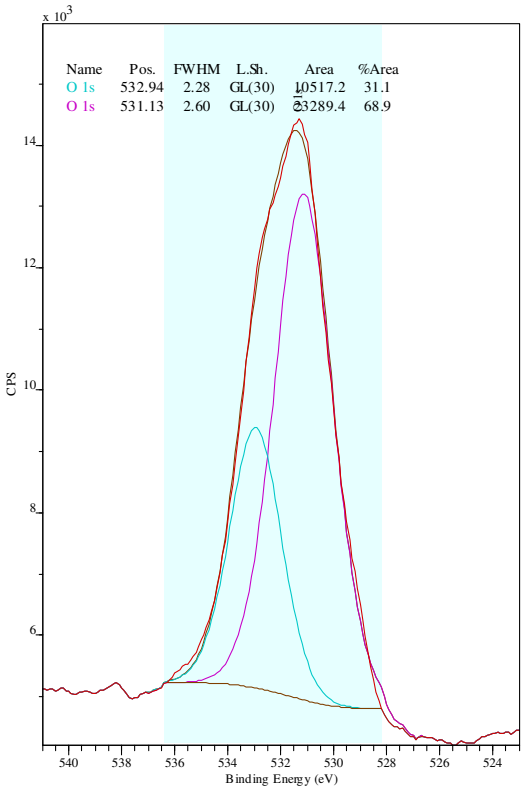
Leached Product after 2 Hours

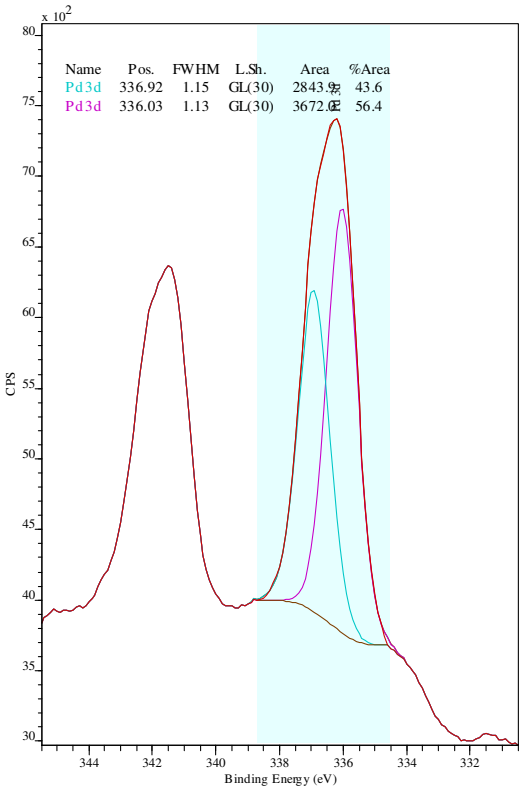


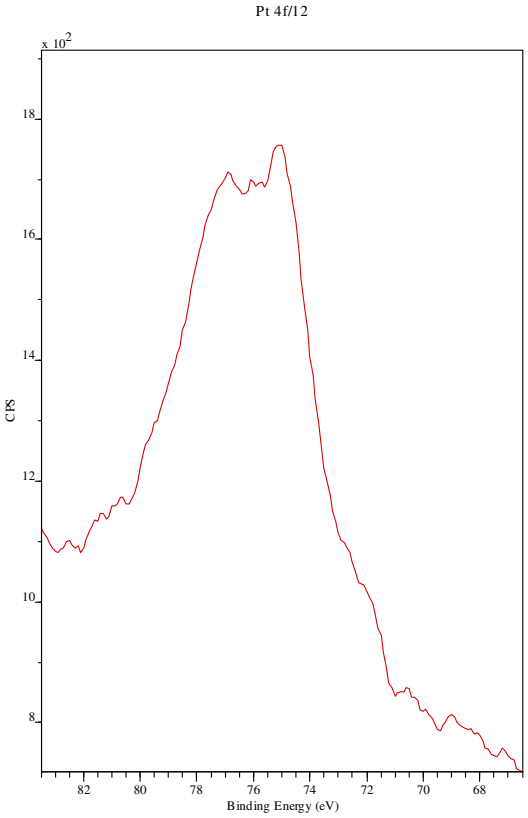
Name	Pos.	FWHM	Area	At%
Cu 2p	932.00	3.26	7305.4	3.4
Ni 2p	856.80	2.70	853.8	0.5
Co 2p	778.40	2.47	690.6	0.5
Fe 2p	714.40	8.31	1846.2	1.9
O 1s	531.20	4.12	16908.1	53.0
Ru 3p	461.60	4.31	2106.8	2.5
Pd 3d	336.00	2.94	8537.4	3.9
Rh 3d	308.00	3.12	3101.7	1.6
C 1s	284.80	2.69	1353.7	11.9
S 2p	162.40	3.78	4942.1	18.1
Pt 4f	75.20	5.59	2335.5	1.0
Se 3d	54.40	7.98	738.6	2.1

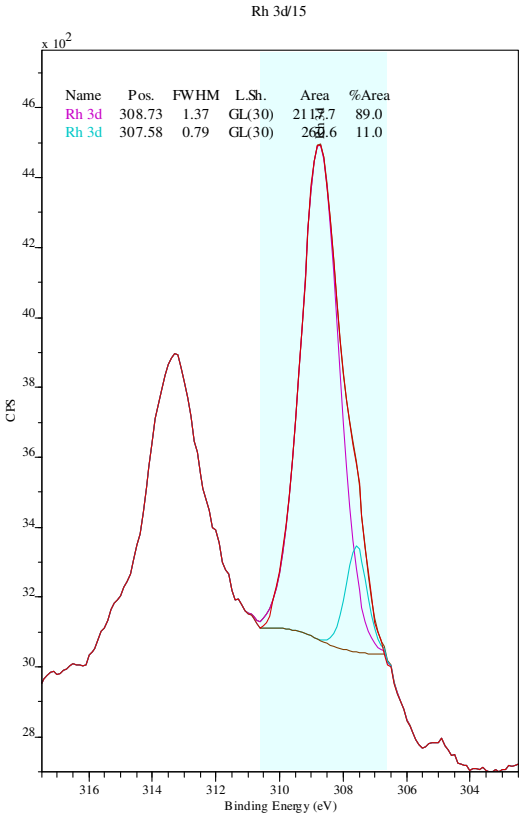

C 1s/20
x 10^2
Name Pos. FWHM L.Sh. Area %Area
C 1s 284.61 2.37 GL(30) 5114.1 63.8
C 1s 280.84 1.65 GL(30) 2905.1 36.2
CPS
Binding Energy (eV)

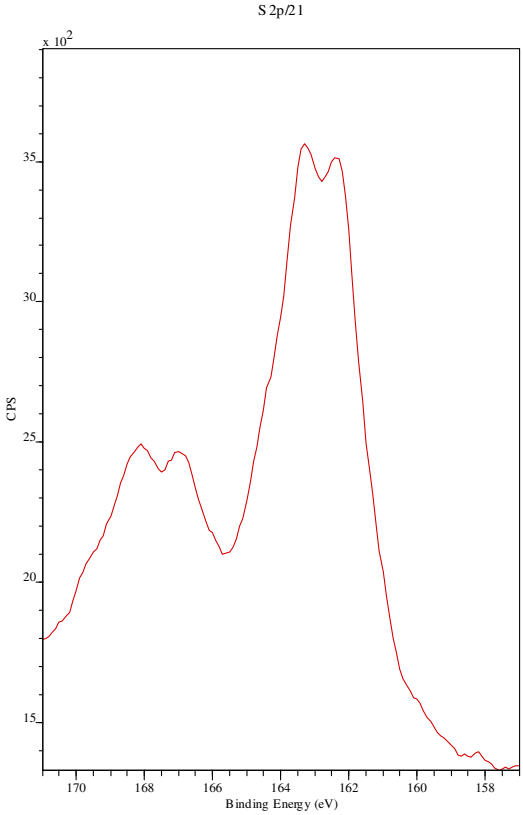

Cu 2p/16
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Cu 2p 942.81 3.23 GL(30) 1894.7 10.0
Cu 2p 933.50 3.98 GL(30) 9546.5 50.6
Cu 2p 932.11 1.19 GL(30) 5881.4 31.2
Cu 2p 930.35 1.96 GL(30) 1529.3 8.1
Cu2p
CPS
Binding Energy (eV)


O 1s/19
x 10^3
Name Pos. FWHM L.Sh. Area %Area
O 1s 532.94 2.28 GL(30) 10517.2 31.1
O 1s 531.13 2.60 GL(30) 23289.4 68.9
CPS
Binding Energy (eV)

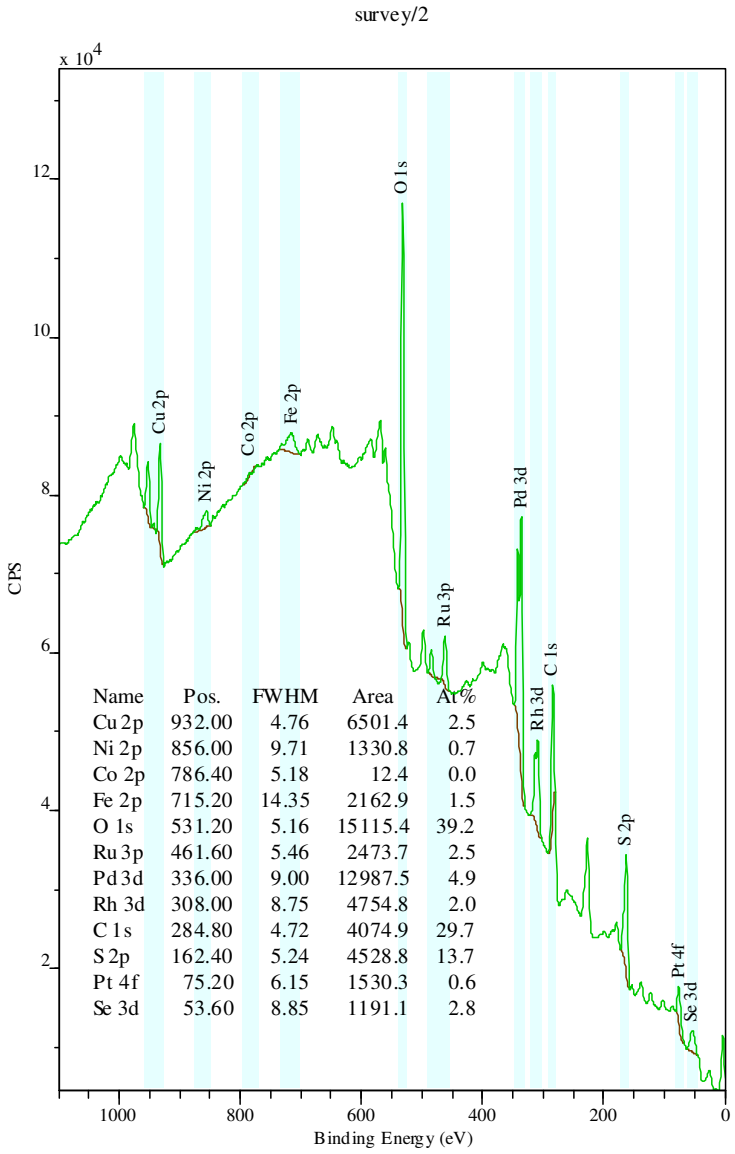

Pd 3d/13
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Pd 3d 336.92 1.15 GL(30) 2843.9 43.6
Pd 3d 336.03 1.13 GL(30) 3672.0 56.4
CPS
Binding Energy (eV)


Pt 4f/12
x 10^2
CPS
Binding Energy (eV)


Rh 3d/15
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Rh 3d 308.73 1.37 GL(30) 2117.7 89.0
Rh 3d 307.58 0.79 GL(30) 268.6 11.0
CPS
Binding Energy (eV)

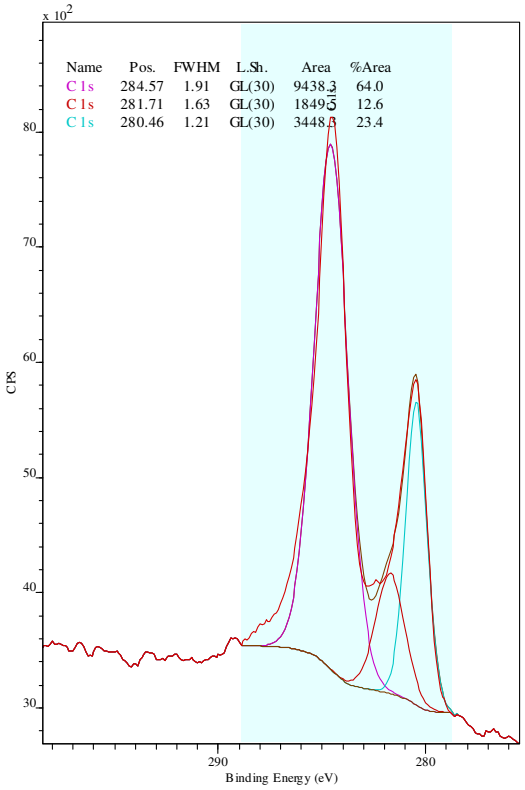

S 2p/21
x 10^2
CPS
Binding Energy (eV)

Leached Product after 4 Hours

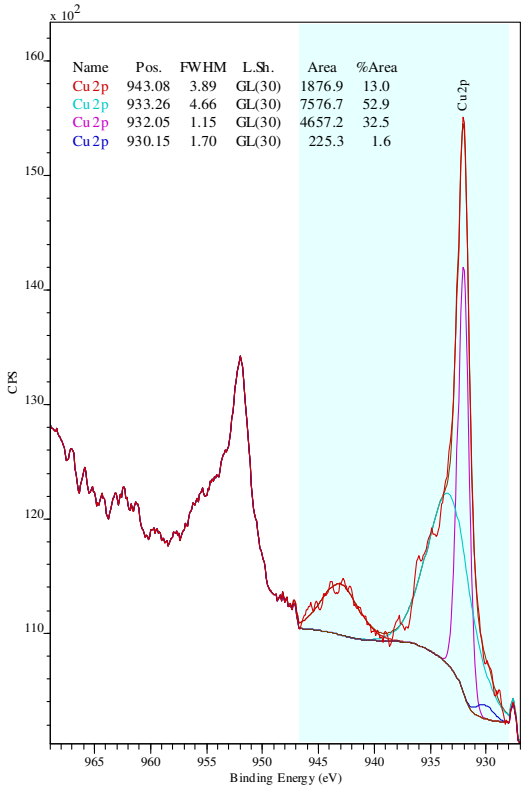


Name	Pos.	FWHM	Area	At%
Cu 2p	932.00	4.76	6501.4	2.5
Ni 2p	856.00	9.71	1330.8	0.7
Co 2p	786.40	5.18	12.4	0.0
Fe 2p	715.20	14.35	2162.9	1.5
O 1s	531.20	5.16	15115.4	39.2
Ru 3p	461.60	5.46	2473.7	2.5
Pd 3d	336.00	9.00	12987.5	4.9
Rh 3d	308.00	8.75	4754.8	2.0
C 1s	284.80	4.72	4074.9	29.7
S 2p	162.40	5.24	4528.8	13.7
Pt 4f	75.20	6.15	1530.3	0.6
Se 3d	53.60	8.85	1191.1	2.8

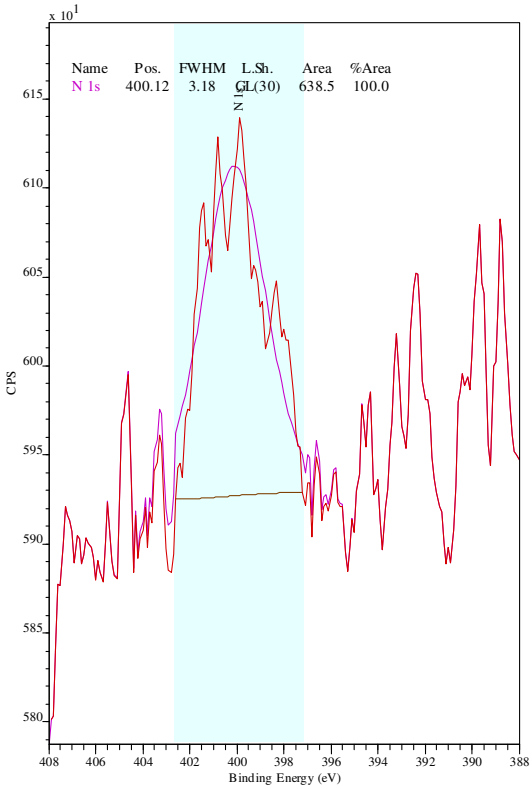
C 1s/20



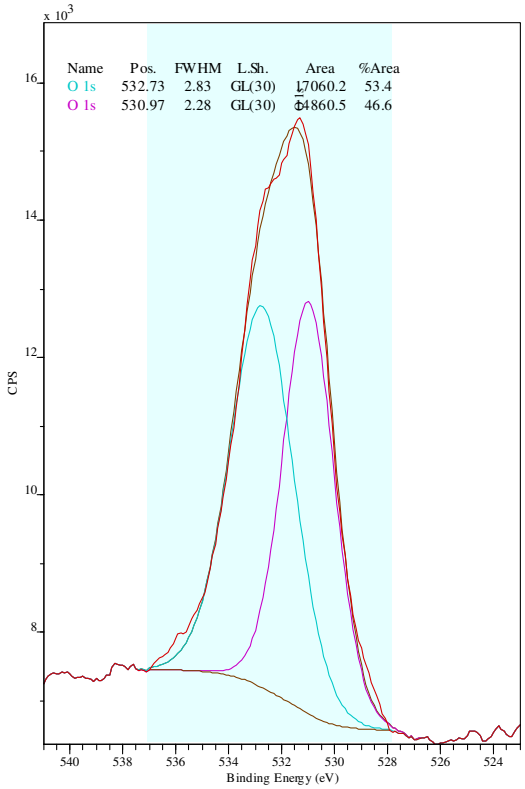
Cu 2p/16

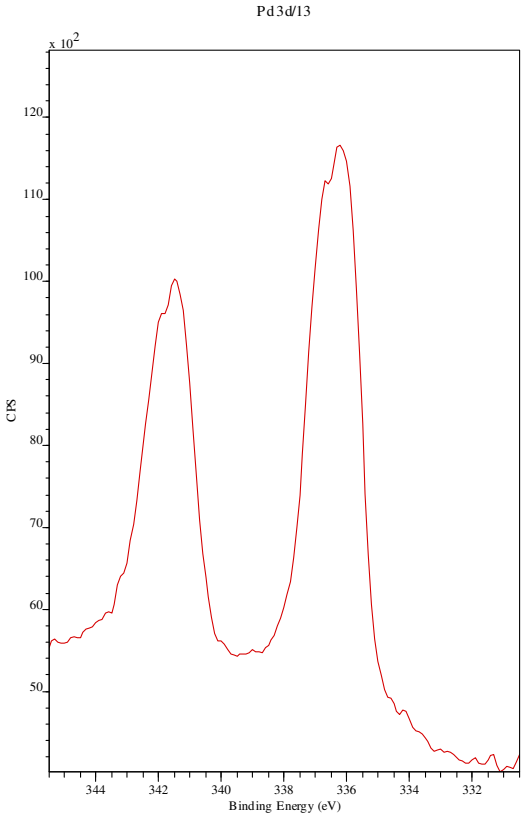


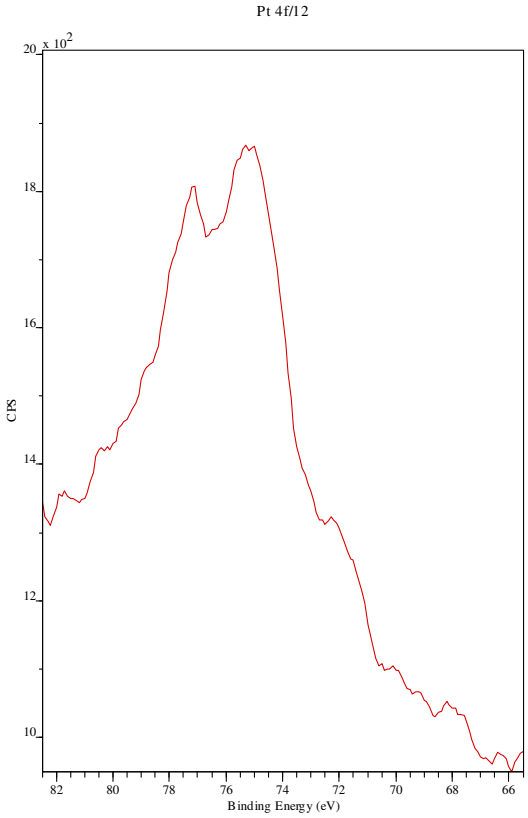
N 1s/22

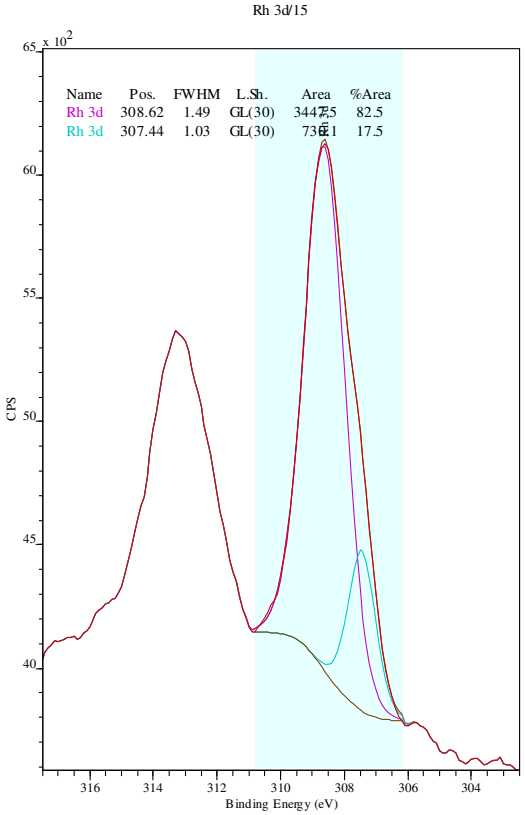


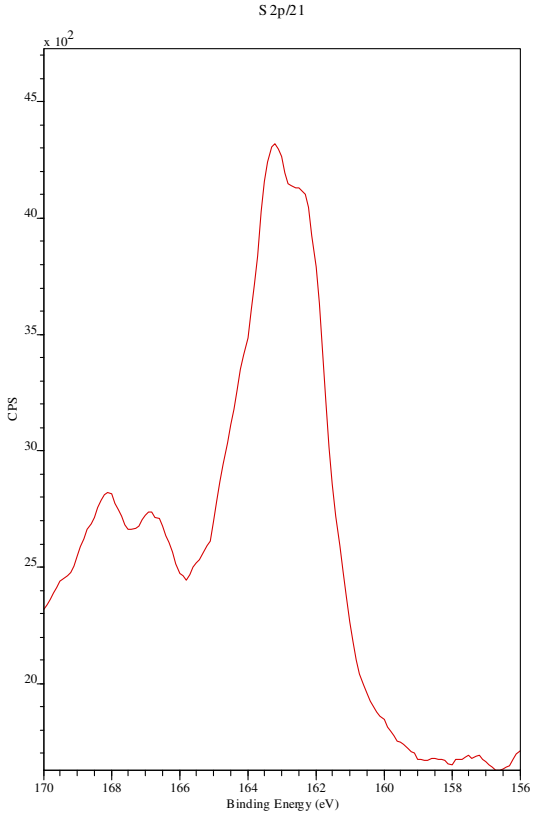
O 1s/19



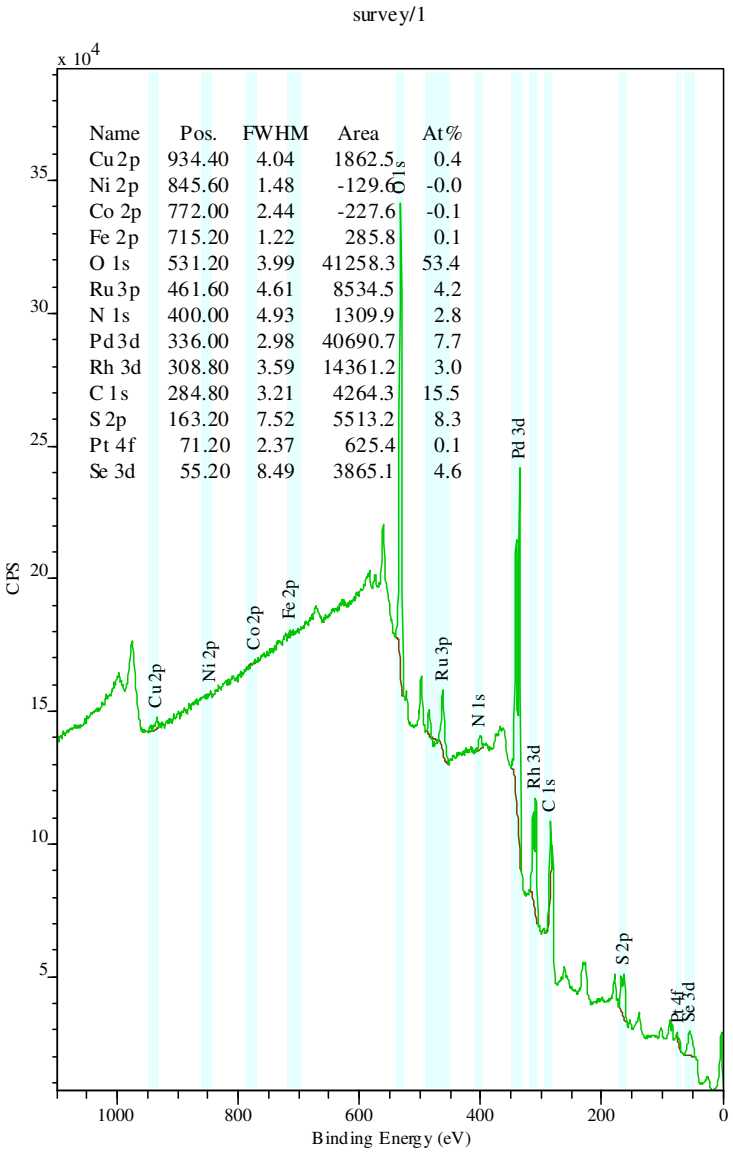

Pd 3d/13
x 10^2
CPS
Binding Energy (eV)


Pt 4f/12
x 10^2
CPS
Binding Energy (eV)

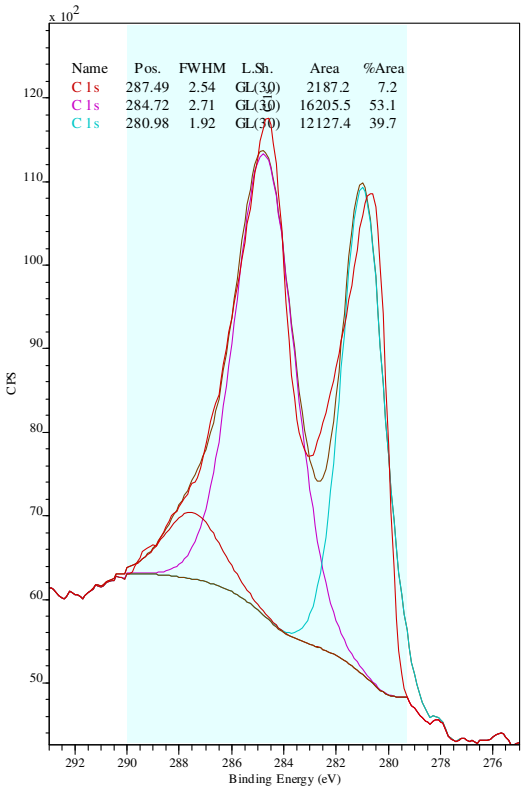

Rh 3d/15
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Rh 3d 308.62 1.49 GL(30) 3447.5 82.5
Rh 3d 307.44 1.03 GL(30) 736.1 17.5
CPS
Binding Energy (eV)


S 2p/21
x 10^2
CPS
Binding Energy (eV)

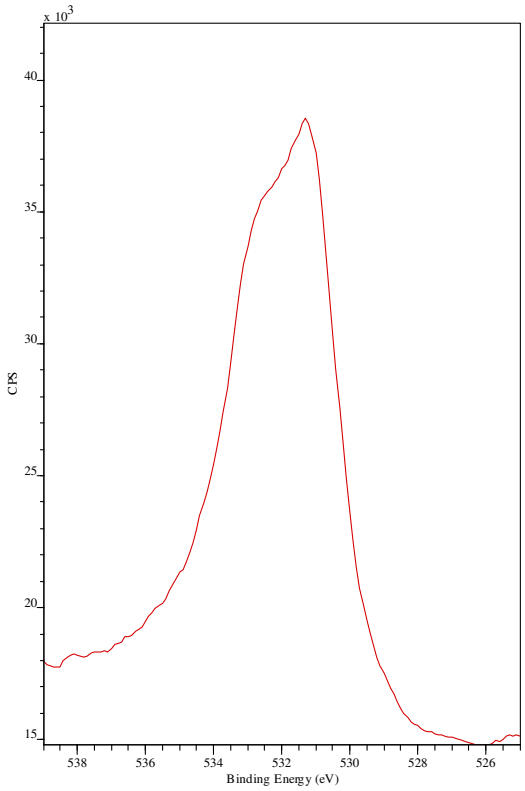
Leached Product after 9 Hours



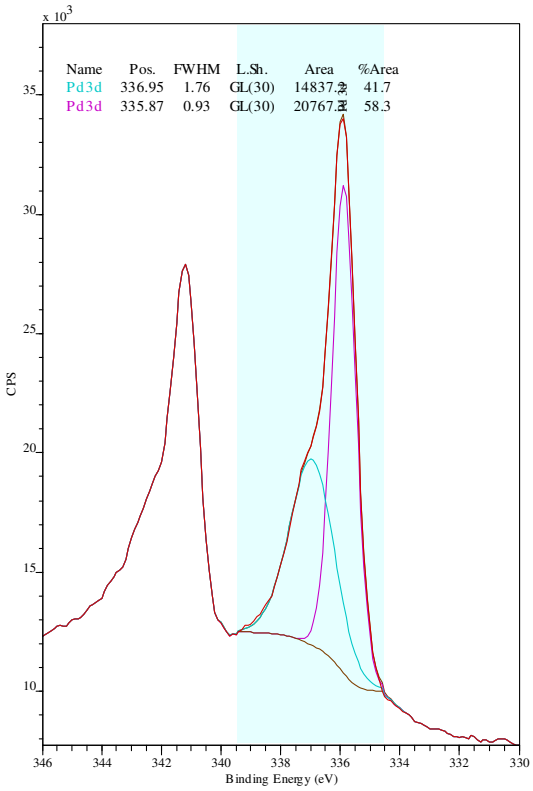
C 1s/6



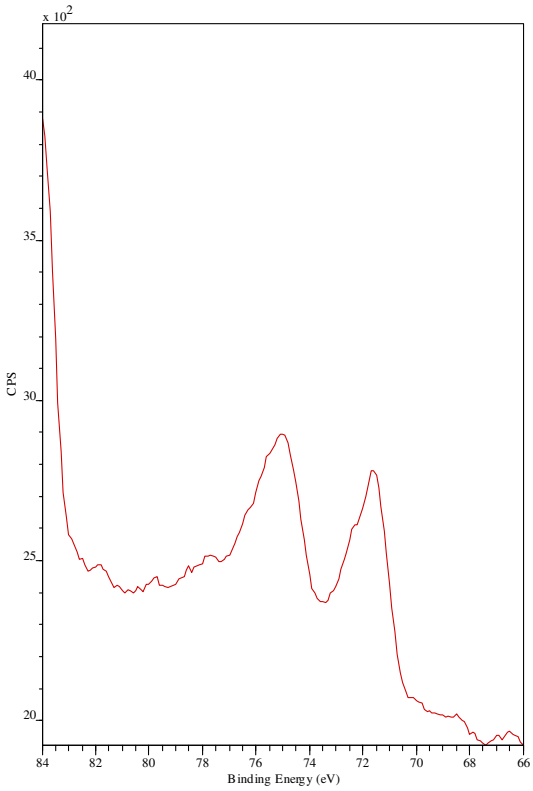
O 1s/5

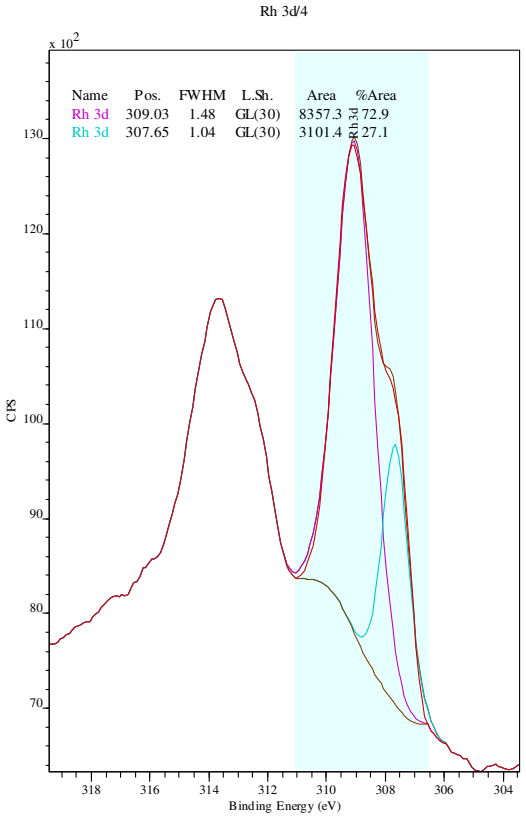


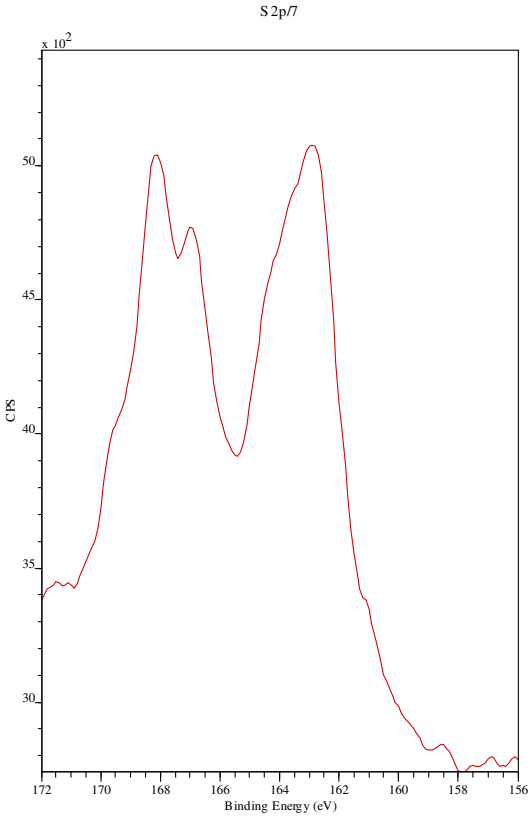
Pd 3d/2

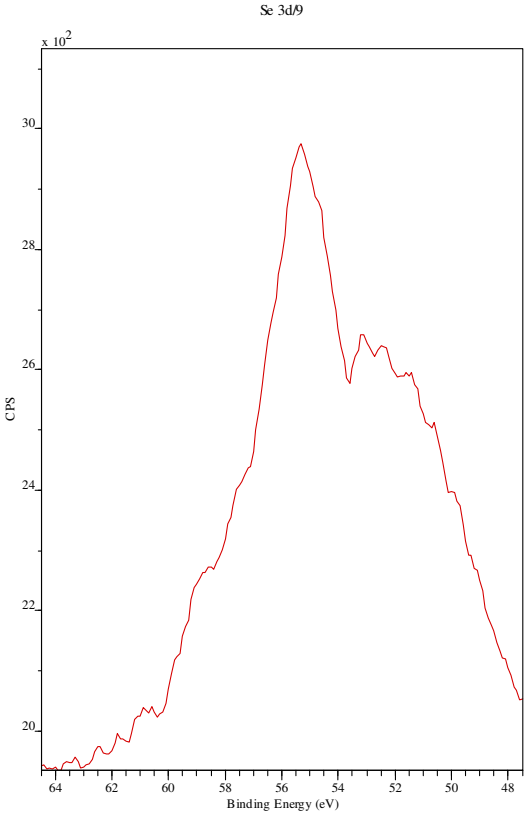


Pt 4f/1

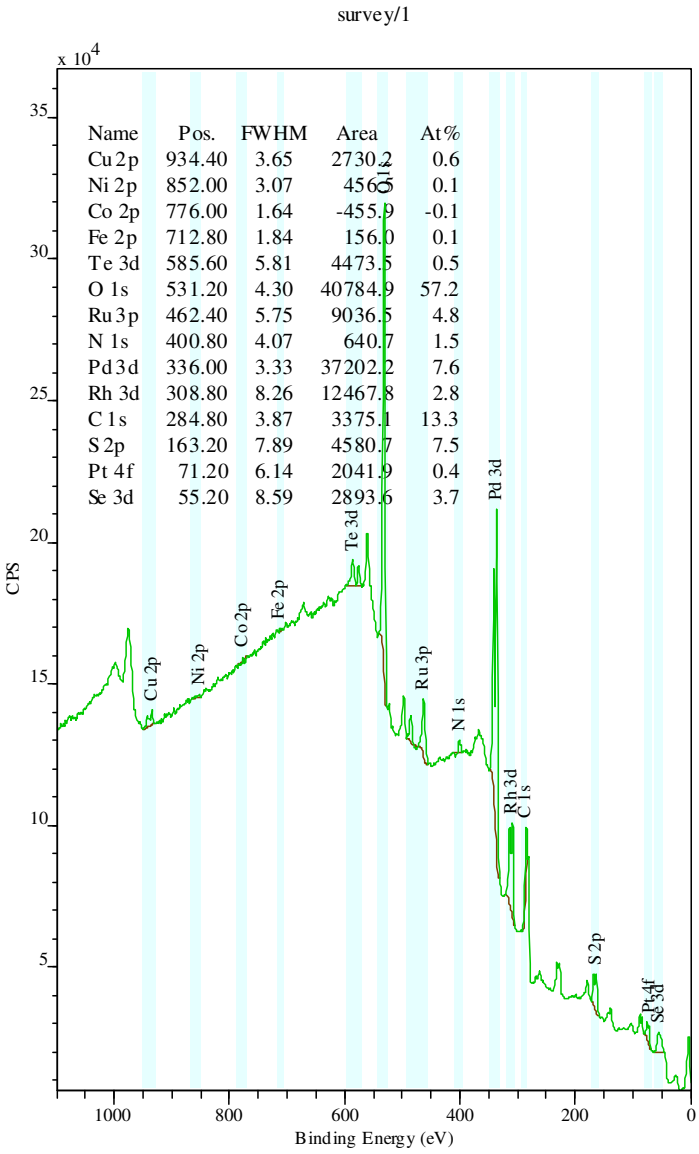



Rh 3d/4
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Rh 3d 309.03 1.48 GL(30) 8357.3 72.9
Rh 3d 307.65 1.04 GL(30) 3101.4 27.1
Rh3d
CPS
Binding Energy (eV)

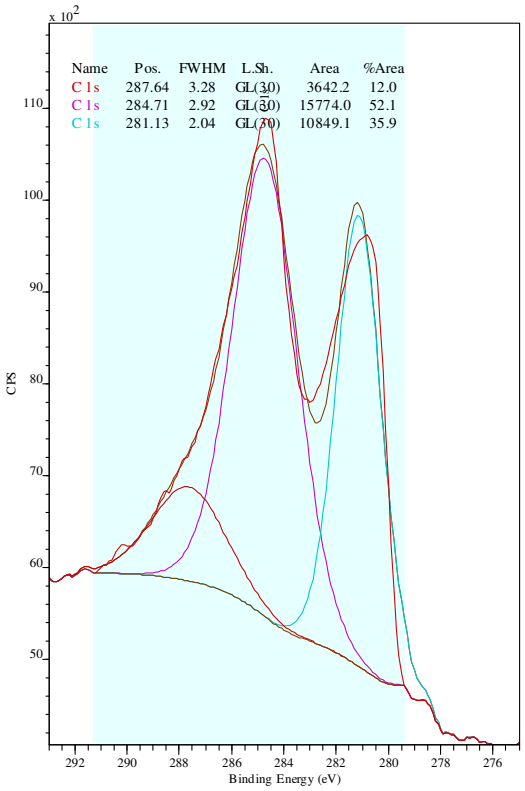

S 2p/7
x 10^2
CPS
Binding Energy (eV)


Se 3d/9
x 10^2
CPS
Binding Energy (eV)

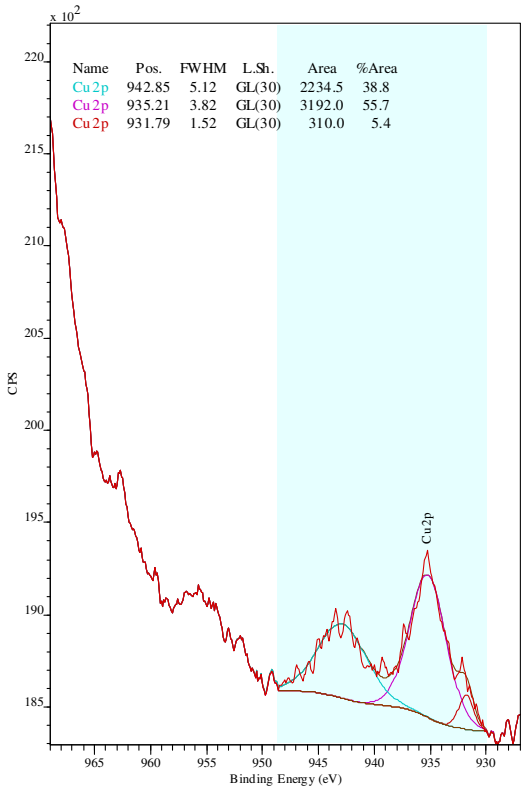
Final Concentrate (FIC)



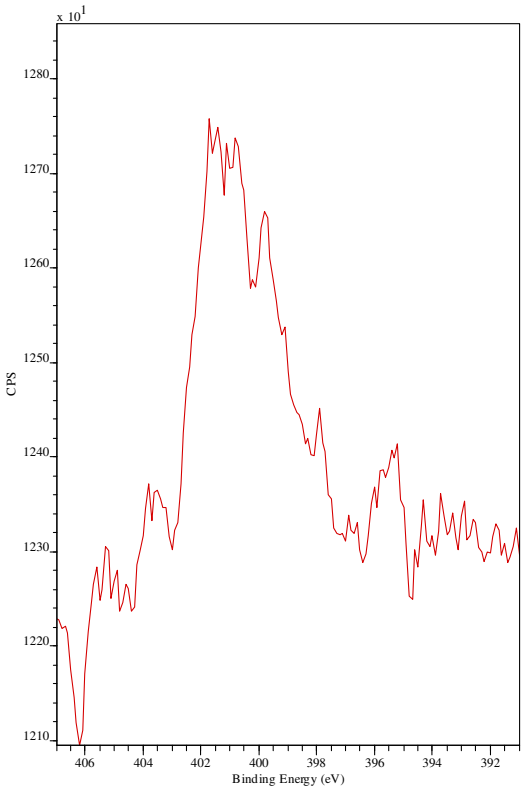
C 1s/9



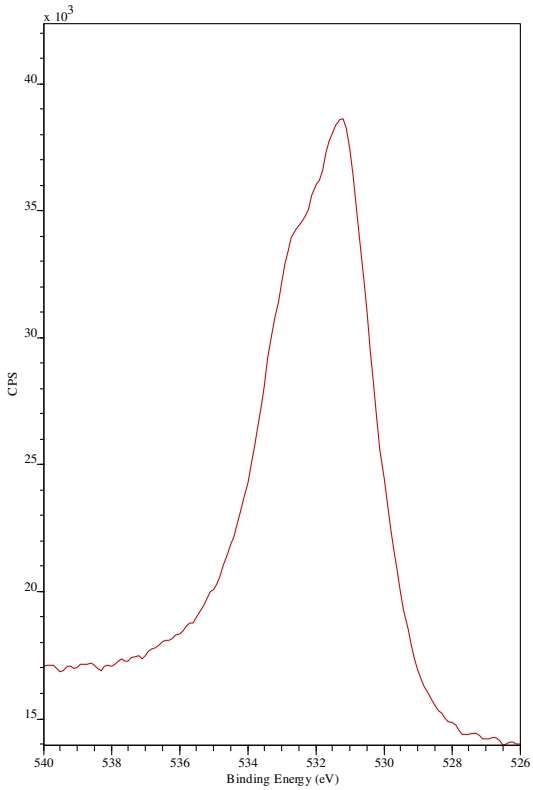
Cu 2p/7

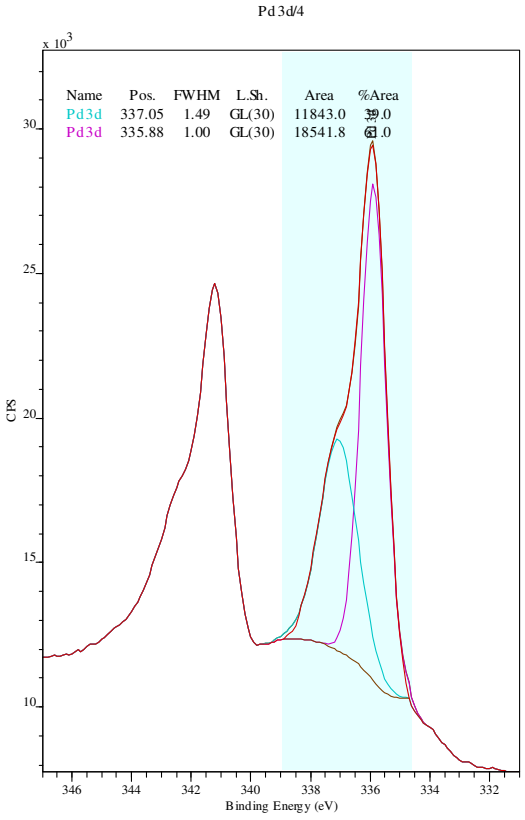


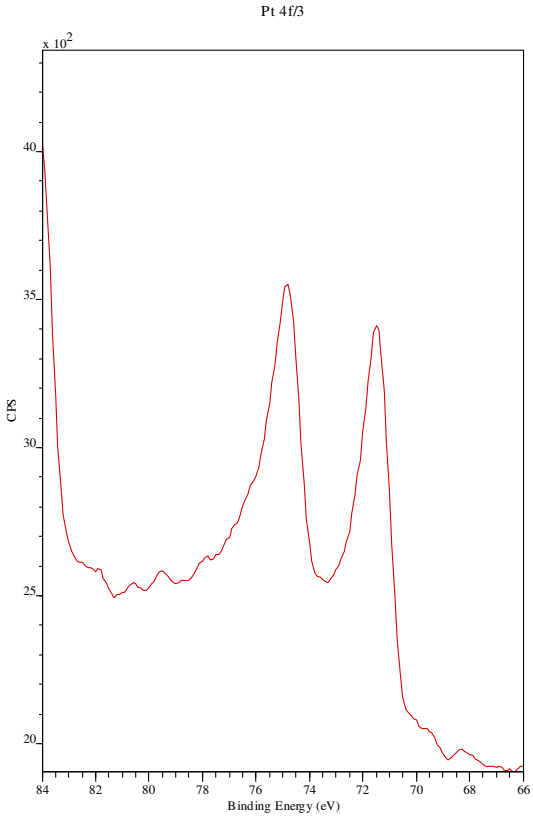
N 1s/11

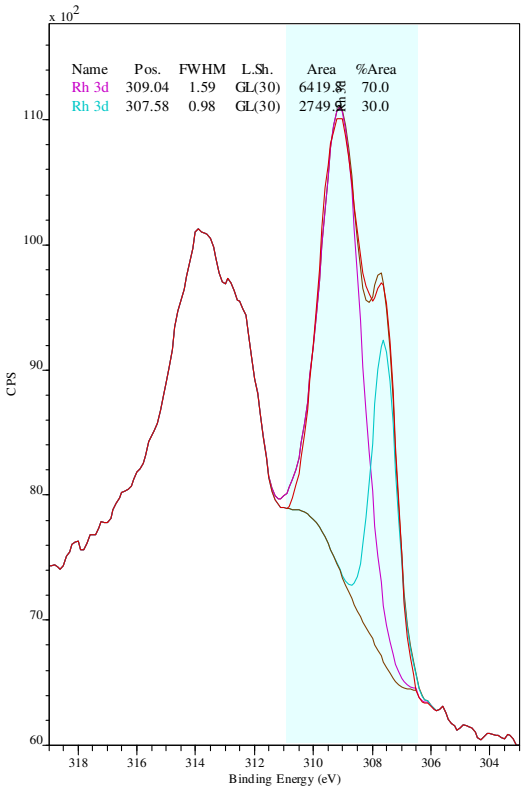


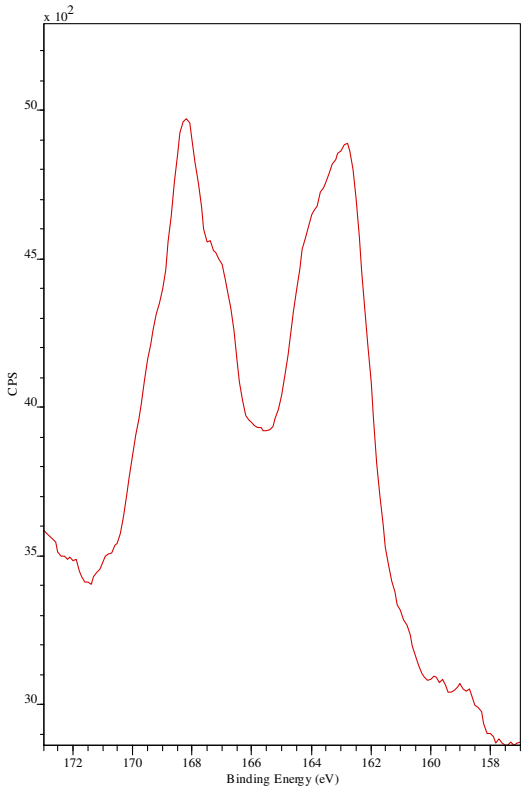
O 1s/8

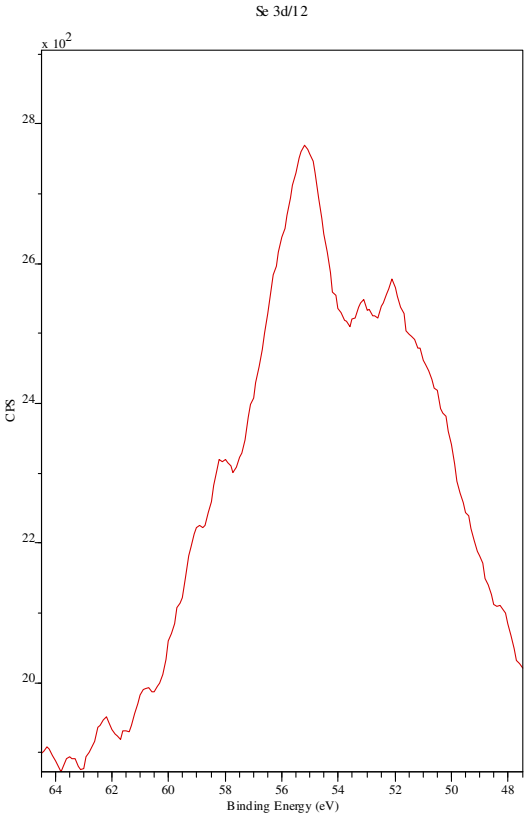


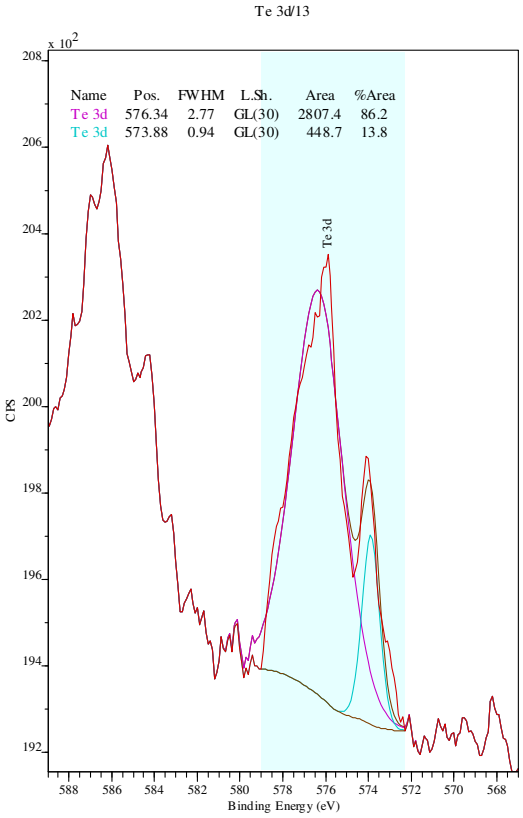

Pd 3d/4
x 10^3
Name Pos. FWHM L.Sh. Area %Area
Pd 3d 337.05 1.49 GL(30) 11843.0 39.0
Pd 3d 335.88 1.00 GL(30) 18541.8 61.0
CPS
Binding Energy (eV)


Pt 4f/3
x 10^2
CPS
Binding Energy (eV)


Rh 3d/6
x 10^2
Name Pos. FWHM L.Sh. Area %Area
Rh 3d 309.04 1.59 GL(30) 6419.8 70.0
Rh 3d 307.58 0.98 GL(30) 2749.6 30.0
CPS
Binding Energy (eV)


S 2p/10
x 10^2
CPS
Binding Energy (eV)


Se 3d/12
x 10^2
28
26
24
22
20
CPS
64
62
60
58
56
54
52
50
48
Binding Energy (eV)


Te 3d/13
x 10^2
208
206
204
202
200
198
196
194
192
CPS
Name Pos. FWHM L.Sh. Area %Area
Te 3d 576.34 2.77 GL(30) 2807.4 86.2
Te 3d 573.88 0.94 GL(30) 448.7 13.8
Te 3d
588
586
584
582
580
578
576
574
572
570
568
Binding Energy (eV)