

Binding energies (BE), full widths at half maximum (FWHM) and the corresponding XPS spectra as used for analysis

Sample	PE line	BE (eV)	FWHM (eV)
Na ₂ SO ₄	C1s	285.0	1.38
	S2p	168.9	1.92
	Na KLL	497.3	1.98
	O1s	531.9	1.46
	Na1s	1071.6	1.51
MgSO ₄	S2p	169.6	2.16
	C1s	285.0	1.69
	Mg KLL	307.7	2.46
	O1s	532.6	1.87
	Mg 1s	1305.3	1.88
CaSO ₄	S2p	169.3	2.07
	C1s	285.0	1.61
	O1s	532.4	1.64
	Ca2s	440.1	3.34
	Ca LMM	1195.2	7.74
BaSO ₄	S2p	168.9	2.10
	C1s	285.0	1.69
	O1s	532.0	1.76
	Ba3d 5/2	780.4	1.89
	Ba3d 3/2	795.7	1.92
FeSO ₄	S2p	169.1	2.45
	C1s	285.0	1.51
	O1s	532.4	2.03
	Fe2p 3/2	711.2	4.39
	Fe2p 1/2	724.4	4.24
CuSO ₄	S2p	169.3	2.13
	C1s	285.0	1.87
	O1s	532.5	1.88
	Cu2p 3/2	935.4	3.97
	Cu2p 1/2	955.4	4.40
ZnSO ₄	S2p	169.4	2.3
	C1s	285.0	1.83
	O1s	532.5	2.23
	Zn2p 3/2	1022.8	1.89
	Zn2p 1/2	1045.8	1.99
PbSO ₄	Pb4f	139.5	1.25
	S2p	169.0	2.00
	C1s	285.0	1.38
	Pb4d 5/2	414.5	4.02
	Pb4d 3/2	436.6	4.69
La ₂ (SO ₄) ₃	O1s	532.0	1.43
	S2p	169.7	2.25
	C1s	285.0	1.72
	O1s	532.5	1.84
	La3d 5/2	836.5	5.81
Sm ₂ (SO ₄) ₃	La3d 3/2	853.1	5.50
	S2p	169.4	2.18
	C1s	285.0	1.69
	O1s	532.4	1.84
	Sm3d 5/2	1084.2	4.23
	Sm3d 3/2	1111.3	4.19

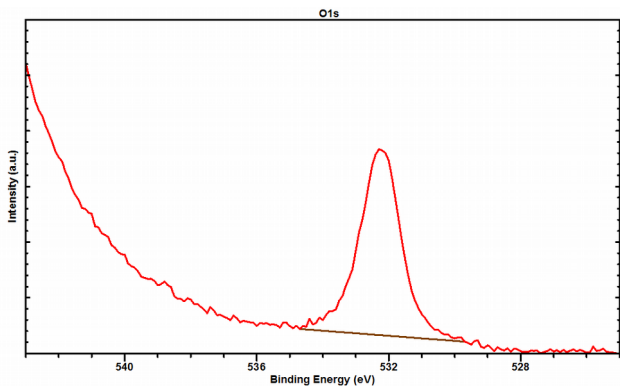
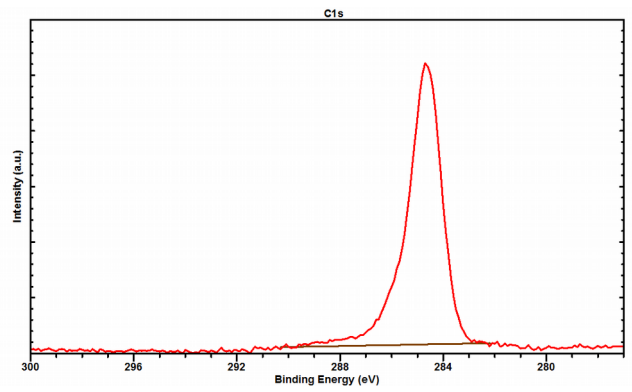
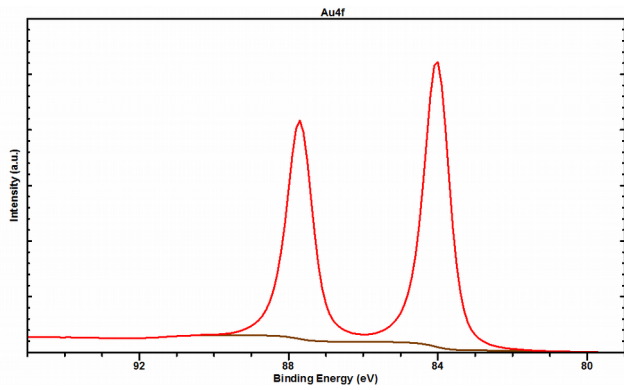
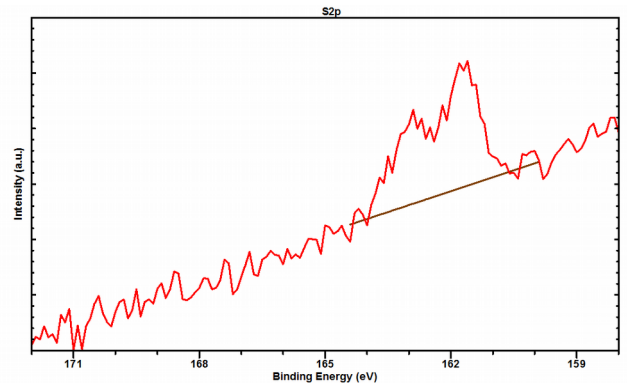
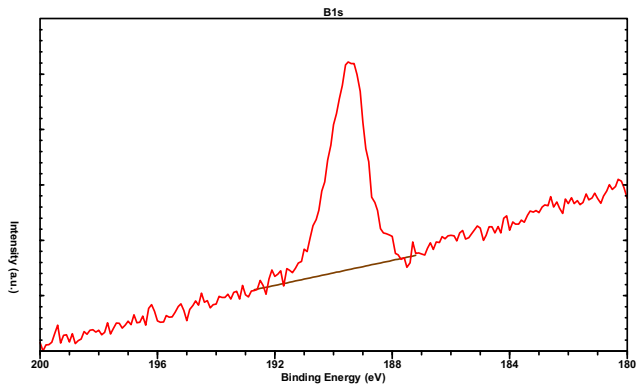
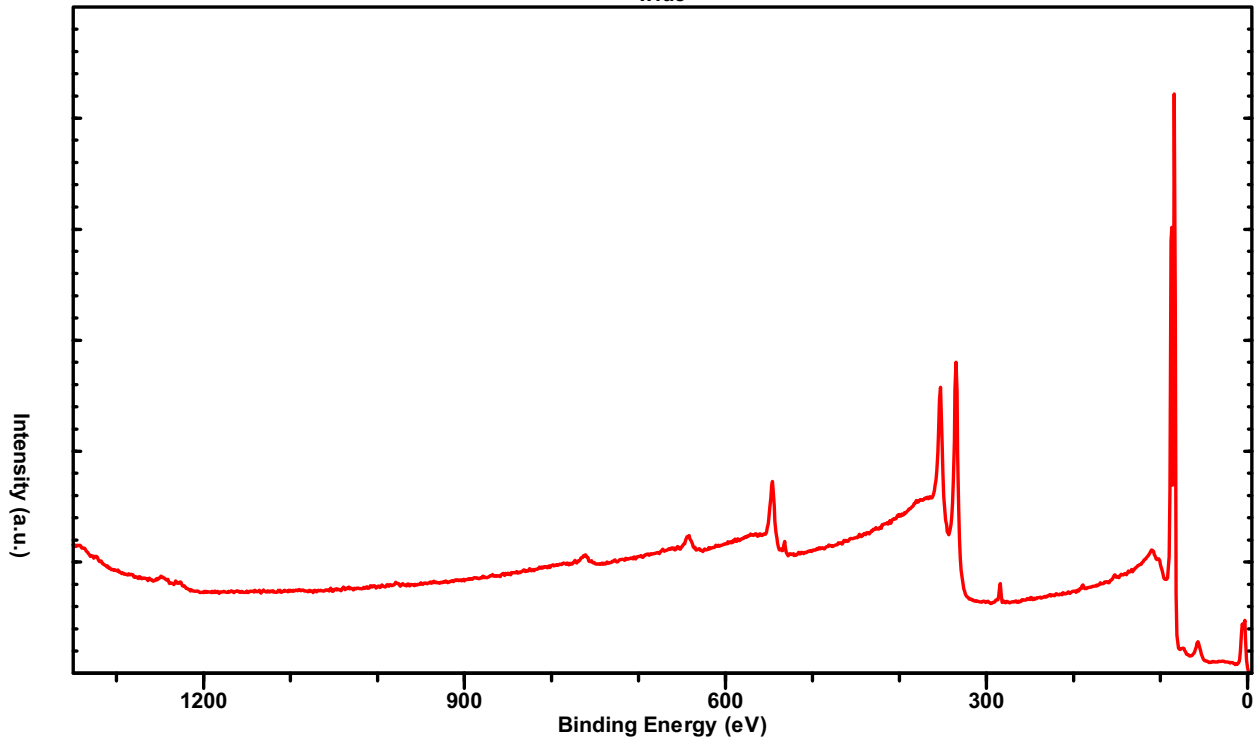
Sample	PE line	BE (eV)	FWHM (eV)
Tb ₂ (SO ₄) ₃	Tb4d 3/2	151.6	6.75
	S2p	169.3	2.03
	C1s	285.0	1.61
	O1s	532.3	1.78
	Tb3d 5/2	1242.7	3.54
	Tb3d 3/2	1277.8	5.62
plain Au immersed in 96% EtOH for 1 hour	Au4f	84.0	0.78
	C1s	284.3	1.57
	O1s	532.8	2.24
	Na1s	1071.6	1.08
plain Au immersed in aq. solution of BaCl ₂ for 1 hour	Au4f	84.0	1.03
	C1s	284.6	1.81
	Ba3d	780.6	1.43
plain Au immersed in aq. solution of NaCl for 1 hour	Au4f	84.0	0.88
	C1s	284.3	1.53
	O1s	531.5	2.66
SAM of M9	Au4f	84.0	0.80
	S2p	161.9	1.07
	B1s	189.5	1.45
	C1s	284.7	1.35
	O1s	532.3	1.36
SAM of M9 + H ₃ O ⁺	Au4f	84.0	0.80
	S2p	161.7	0.94
	B1s	189.4	1.44
	C1s	284.5	1.51
	O1s	532.1	1.50
	Na1s	1071.5	0.69
SAM of M9-COOH	Au4f	84.0	0.81
	S2p	161.8	0.85
	B1s	189.4	1.39
	C1s	284.8	2.00
	O1s	532.3	2.87
SAM of M9-COOH + H ₃ O ⁺	Na1s	1071.7	1.51
	Au4f	84.0	0.80
	S2p	161.7	0.68
	B1s	189.1	1.29
	C1s	284.5	1.57
	O1s	532.3	3.21
SAM of P1-COOH + H ₃ O ⁺	Na1s	1071.6	1.53
	Au4f	84.0	0.80
	S2p	162.4	0.89
	B1s	189.0	1.00
	C1s	284.6	2.33
SAM of P1-COOH + H ₃ O ⁺	O1s	531.8	2.28
	Na1s	1071.7	1.53
	Au4f	84.0	0.79
	S2p	162.4	0.65
	B1s	189.0	1.20
	C1s	284.3	1.42
SAM of P1-COOH + H ₃ O ⁺	O1s	532.3	2.45
	Na1s	1071.4	1.47

Sample	PE line	BE (eV)	FWHM (eV)
SAM of M9-COOH + Na(I)	Au4f	84.0	0.80
	S2p	161.7	0.99
	B1s	189.4	1.37
	C1s	285.1	1.91
	O1s	531.5	2.60
	Na1s	1071.9	1.45
SAM of M9-COOH + Mg(II)	Au4f	84.0	0.80
	S2p	161.7	0.86
	B1s	189.3	1.38
	C1s	284.9	1.93
	Mg KLL	306.3	1.84
	O1s	531.9	2.25
	Na1s	1071.9	0.54
	Mg1s	1304.6	1.52
SAM of M9-COOH + Sr(II)	Au4f	84.0	0.67
	Sr3d	134.0	1.34
	S2p	161.7	0.84
	B1s	189.3	1.20
	C1s	285.3	1.69
SAM of M9-COOH + Ba(II)	Au4f	84.0	0.84
	S2p	161.6	2.17
	B1s	189.4	1.54
	C1s	2.85	1.75
	O1s	531.6	2.23
	Ba3d 5/2	780.6	1.65
	Ba3d 3/2	795.8	1.61
Ba3p	1062.8	4.92	
SAM of M9-COOH + Cr(III)	S2p	162.3	1.35
	B1s	189.9	2.14
	C1s	285.0	2.69
	O1s	532.9	2.82
SAM of M9-COOH + Fe(II)	S2p	162,2	1.93
	B1s	189.7	1.88
	C1s	285.0	2.53
SAM of M9-COOH + Fe(III)	Fe2p	711.4	7.4
	S2p (thiolate)	162.1	2.20
	S2p (sulfate)	169.2	0.51
	B1s	189.7	2.10
	C1s	285.0	2.60
	O1s	531.8	2.70
SAM of M9-COOH + Co(II)	Fe2p	711.7	6.85
	Au4f	84.0	0.71
	S2p	161.8	0.83
	B1s	284.9	1.93
	C1s	532.0	1.89
	O1s	189.2	1.22
	Co2p	781.4	1.76

Sample	PE line	BE (eV)	FWHM (eV)
SAM of M9-COOH + Ni(II)	Au4f	84.1	0.66
	S2p	162.0	0.87
	B1s	189.4	1.40
	C1s	285.0	1.91
	O1s	532.0	2.56
	Ni2p	856.1	1.59
SAM of M9-COOH + Cu(II)	S2p	162.5	2.32
	B1s	189.8	2.07
	C1s	285.0	2.53
	Cu2p	932.6	3.11
SAM of M9-COOH + Zn(II)	S2p	162.0	1.98
	B1s	189.6	2.15
	C1s	285.0	2.74
	O1s	532.3	2.72
	Zn2p	1022.7	2.58
SAM of M9-COOH + La(III)	S2p	163.1	2.15
	B1s	189.6	1.53
	C1s	285.0	2.45
	O1s	532.5	2.55
	La3d 5/2	839.2	65.70
SAM of M9-COOH + Sm(III)	La3d 3/2	855.9	5.42
	S2p	162.0	1.88
	B1s	189.7	1.62
	C1s	285.0	2.33
	O1s	532.8	2.64
SAM of M9-COOH + Tb(III)	Sm3d	10.85.5	4.67
	Tb4d 3/2	152.6	6.71
	S2p (thiolate)	162.0	1.87
	S2p (sulfate)	169.8	0.40
	B1s	189.3	2.31
	C1s	285.0	2.86
	O1s	532.2	2.62
SAM of M9-COOH + Tl(I)	Tb3d 5/2	1243.6	9.79
	Tb3d 3/2	1277.0	4.15
	Tl4f	117.9	1.01
	S2p	161.8	1.33
	B1s	189.3	1.38
SAM of M9-COOH + Pb(II)	C1s	284.6	1.68
	O1s	531.0	2.37
	Pb4f	139.6	1.36
	S2p	162.2	1.07
	B1s	189.8	1.27
	C1s	285.0	2.01
	Pb4d 5/2	414.6	3.28
Pb4d 3/2	436.5	2.52	
O1s	531.9	2.33	

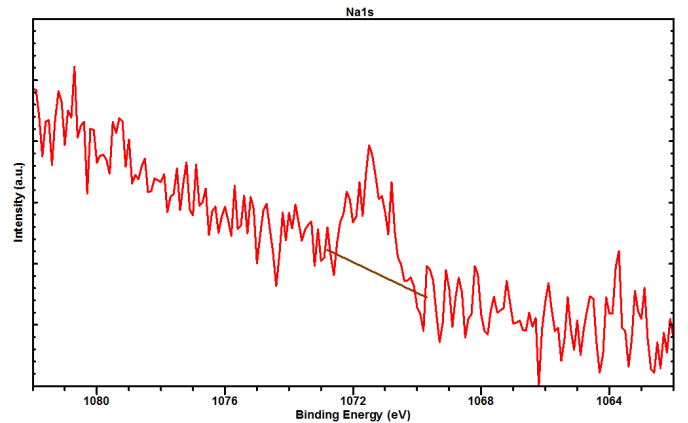
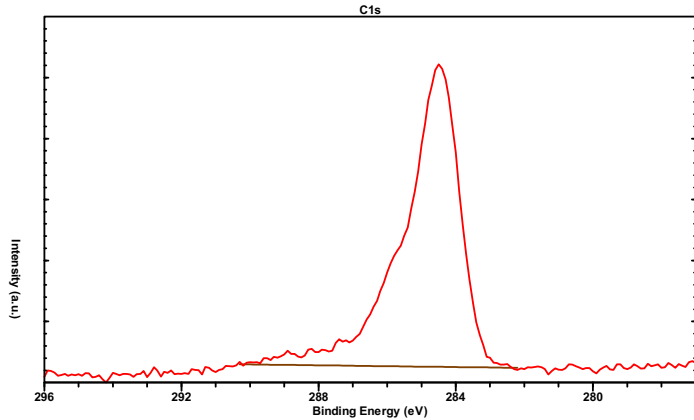
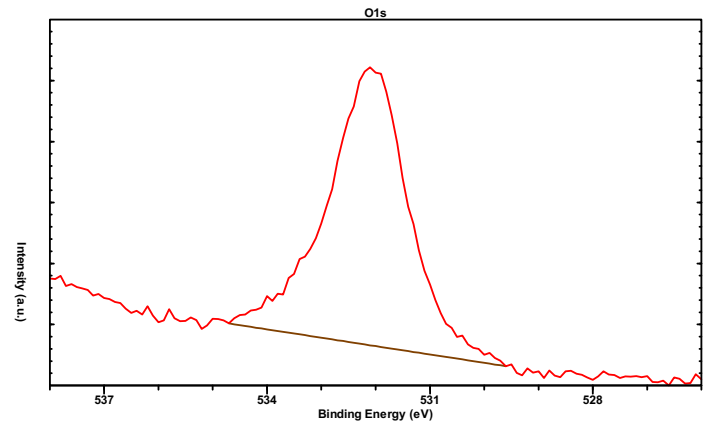
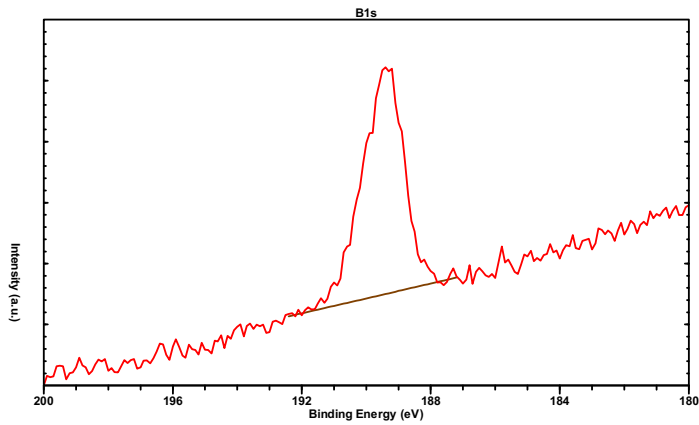
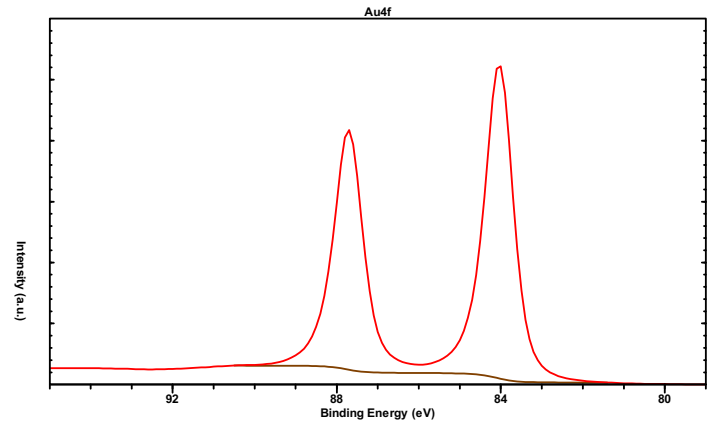
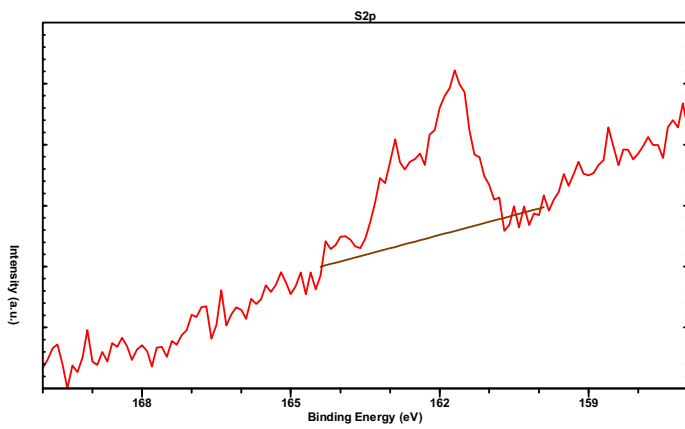
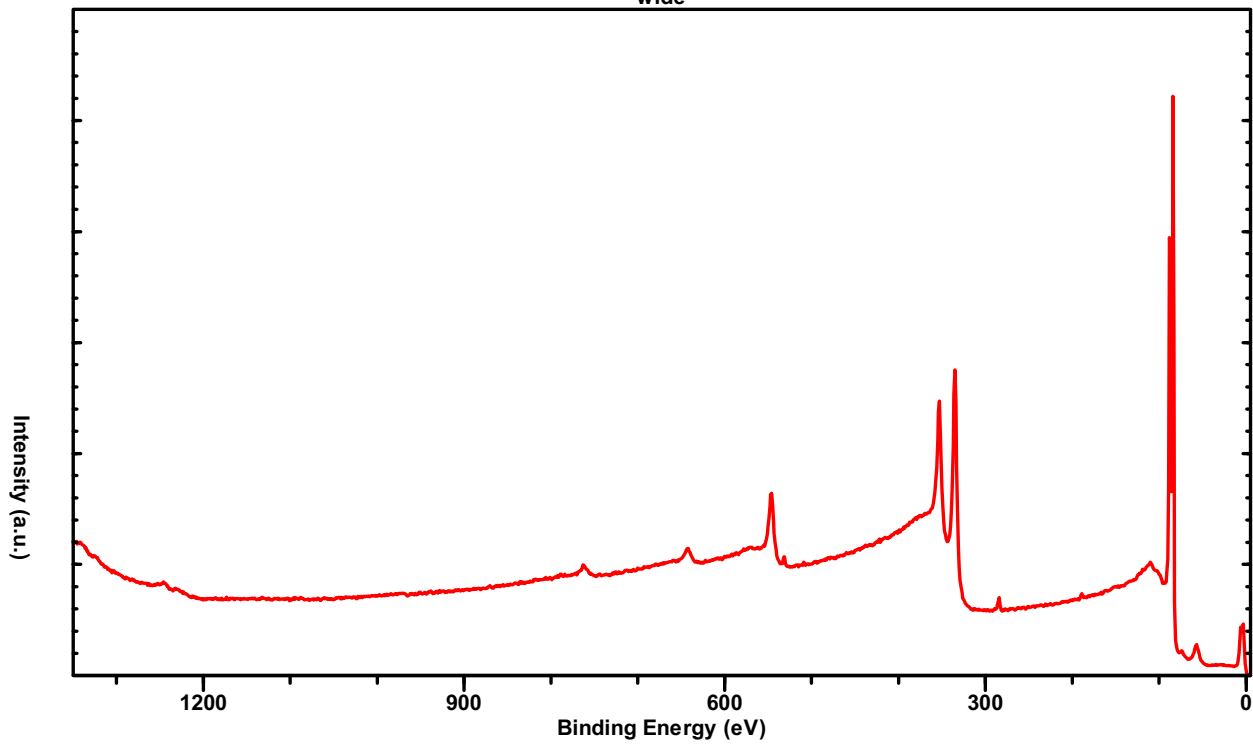
SAM of M9

wide



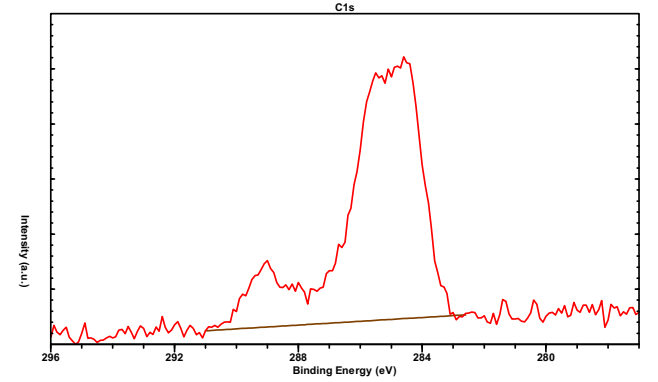
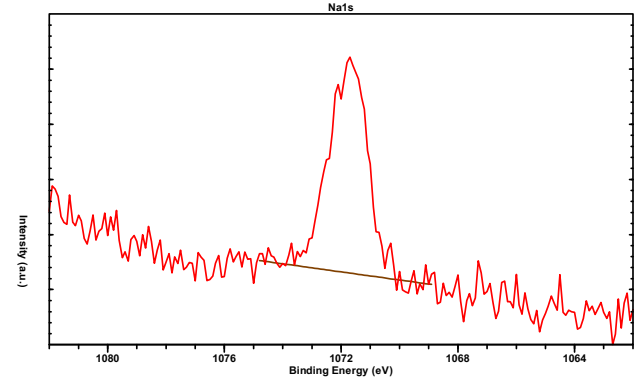
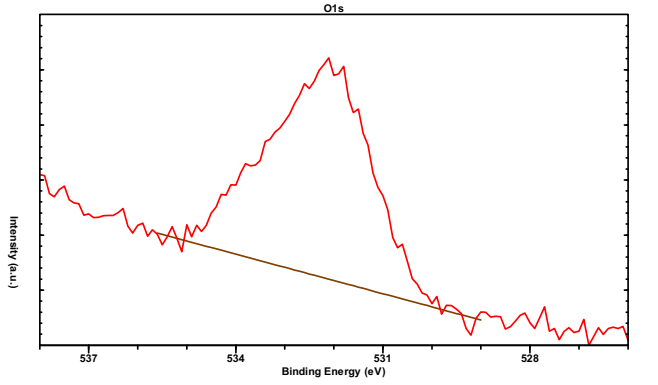
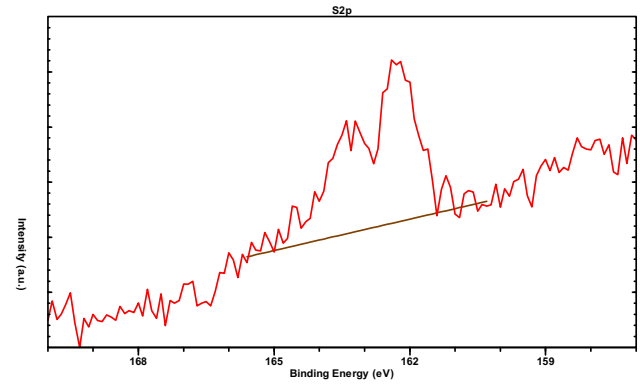
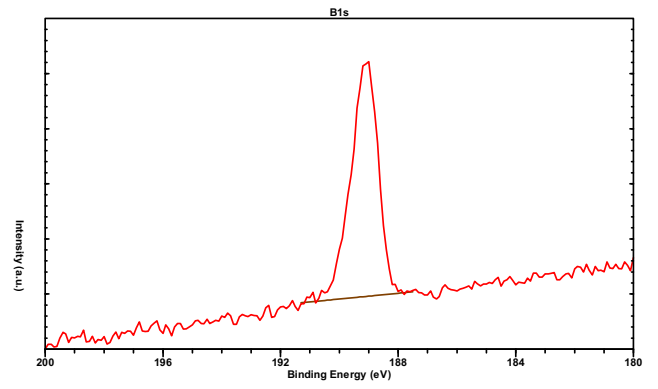
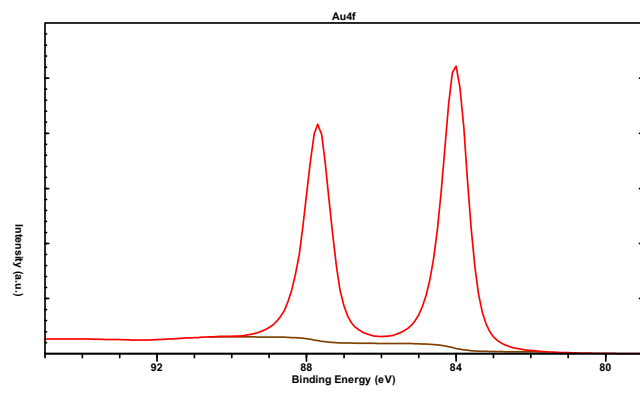
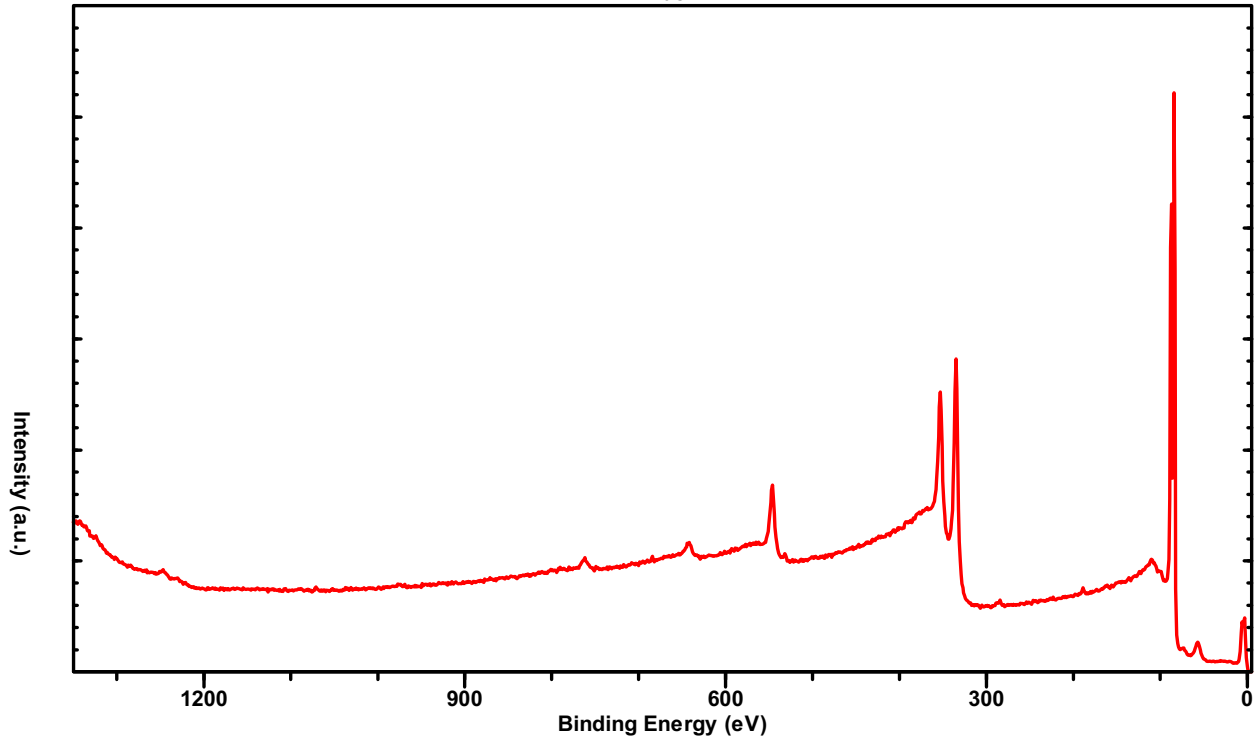
SAM of M9 + H₃O⁺

wide



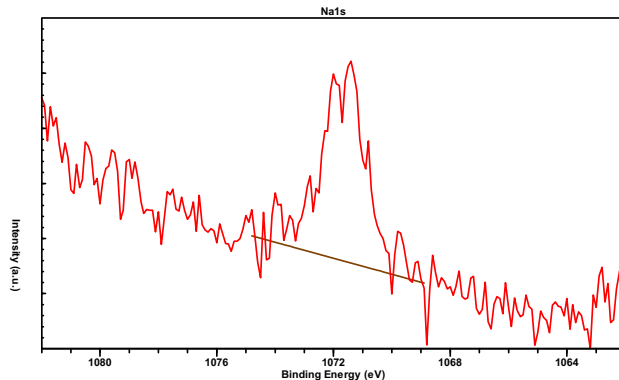
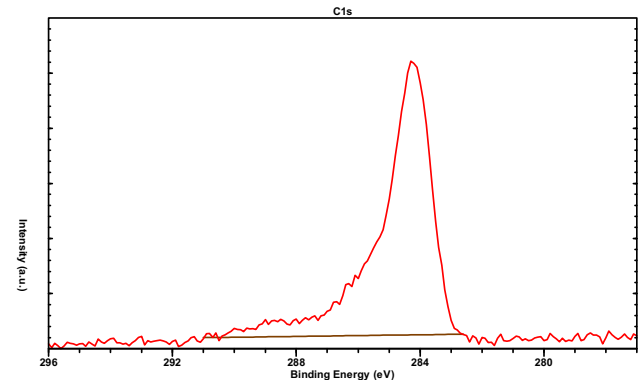
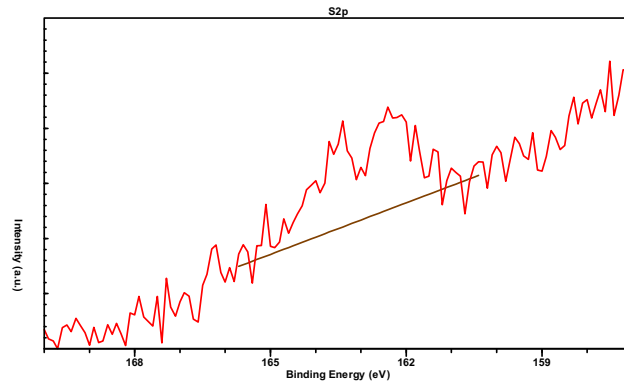
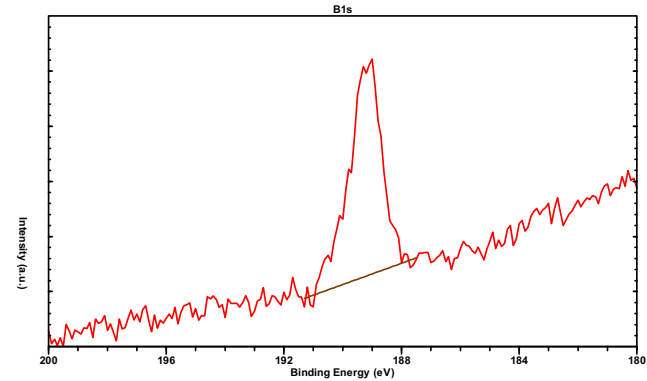
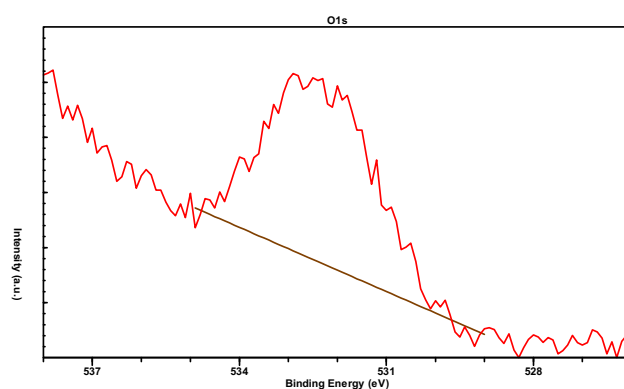
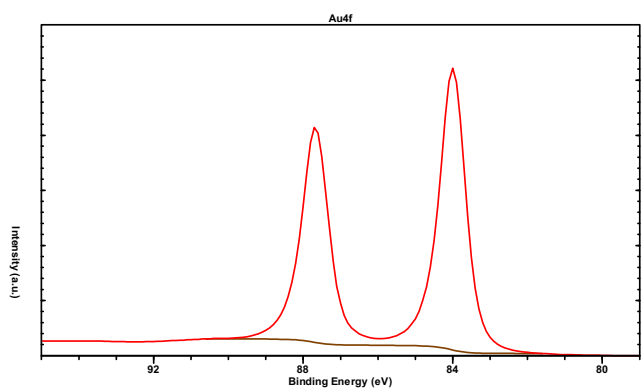
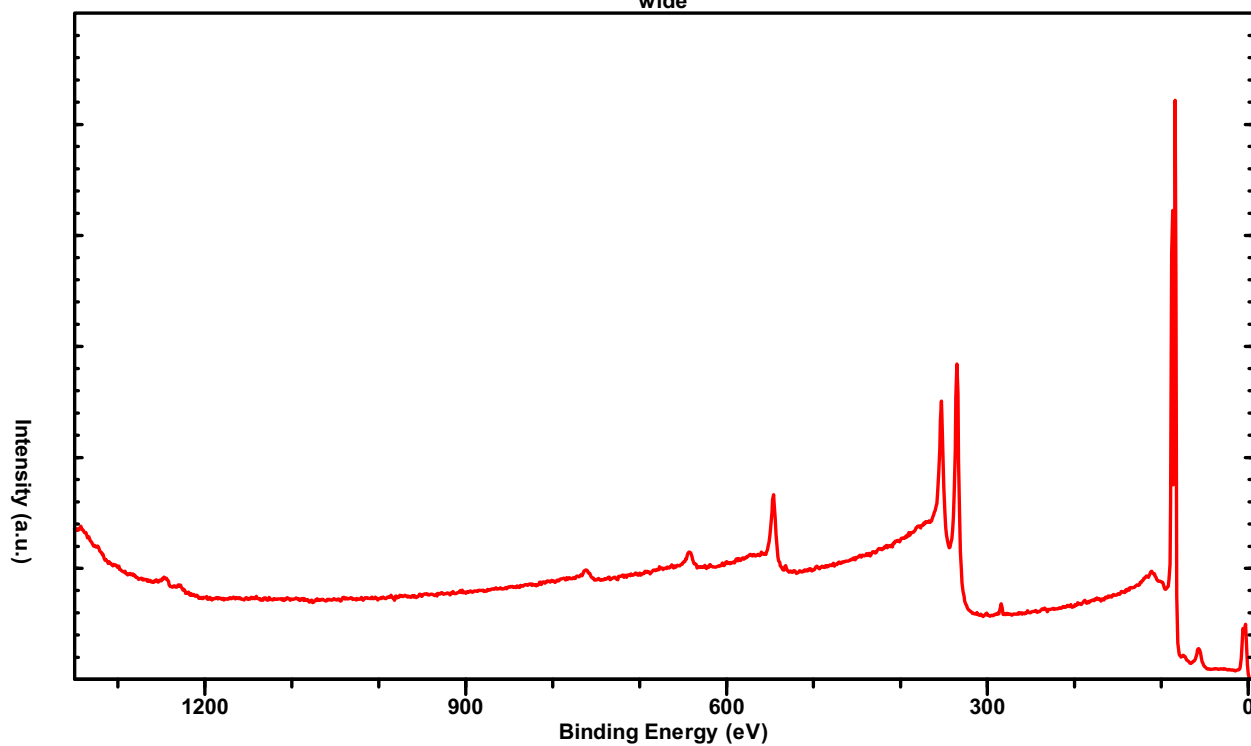
SAM of P1-COOH

wide



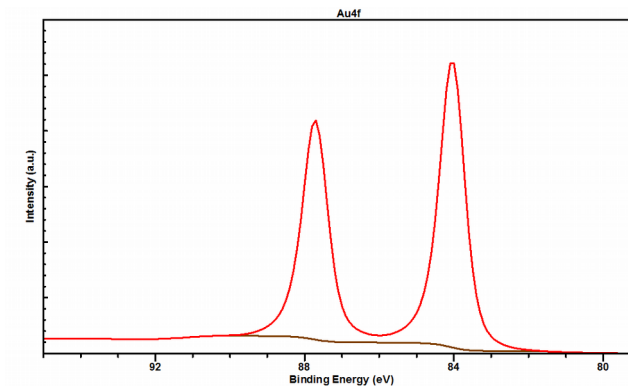
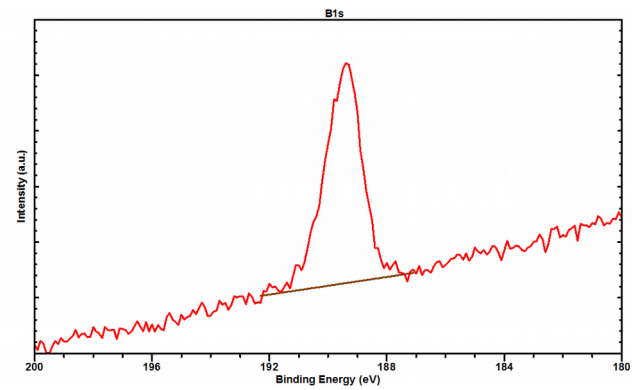
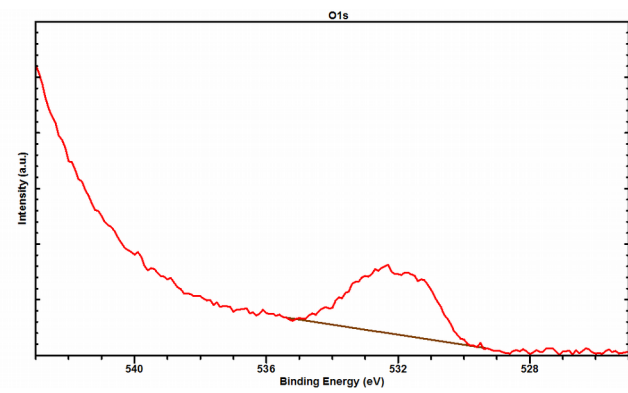
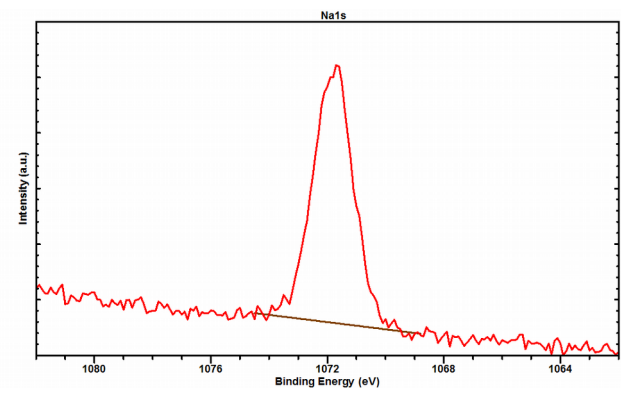
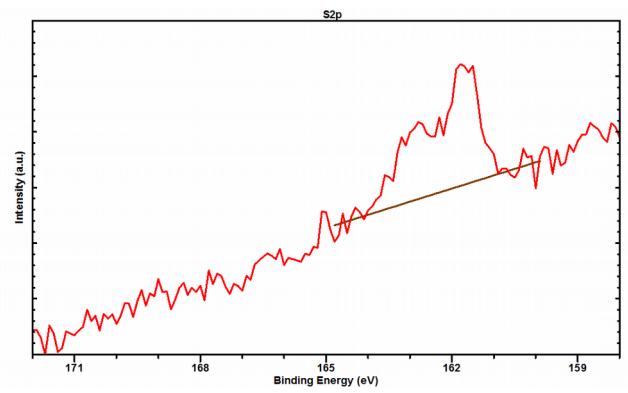
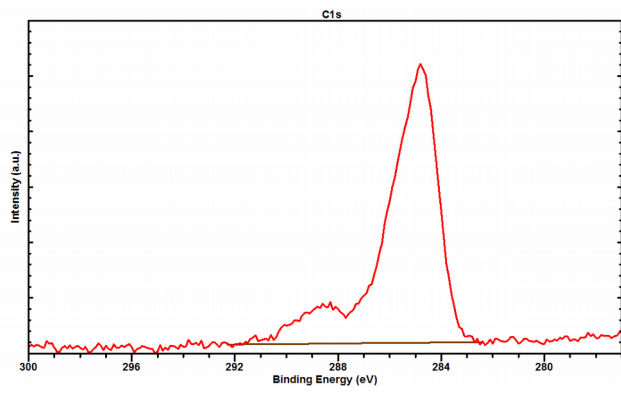
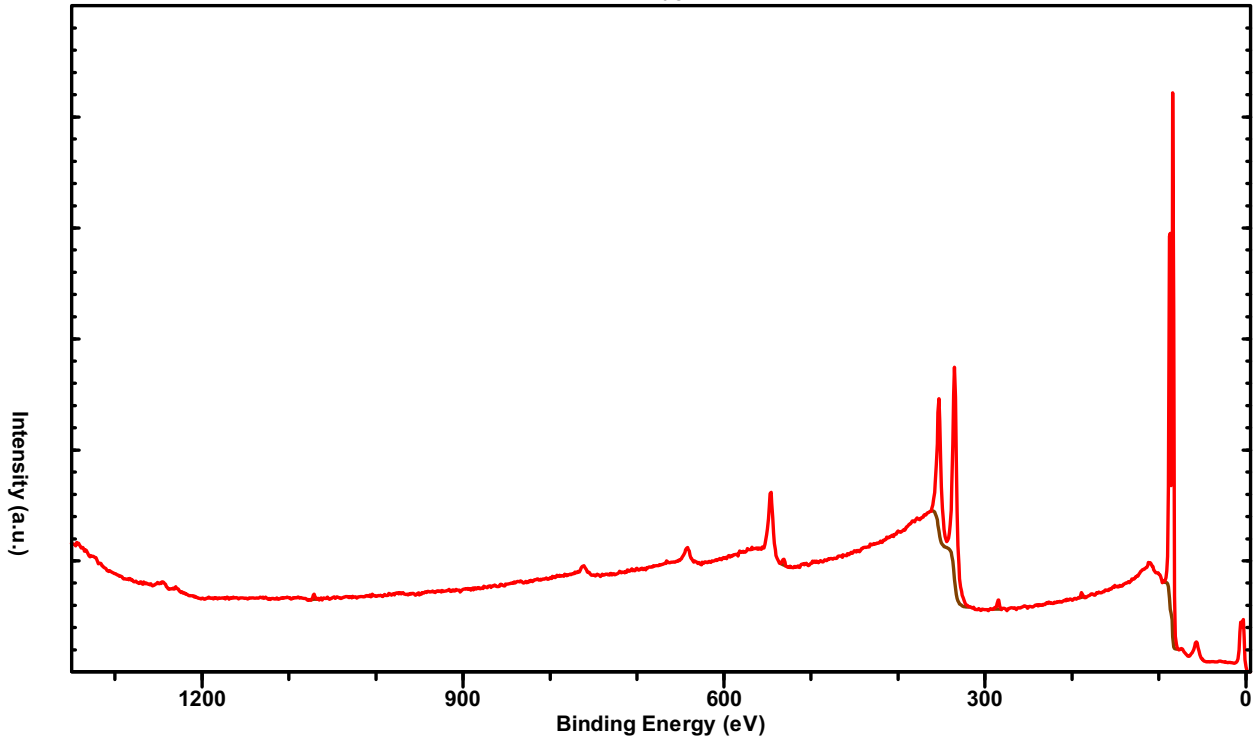
SAM of P1-COOH + H₃O⁺

wide



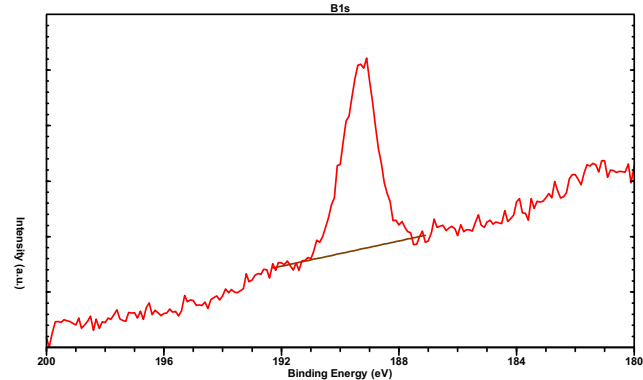
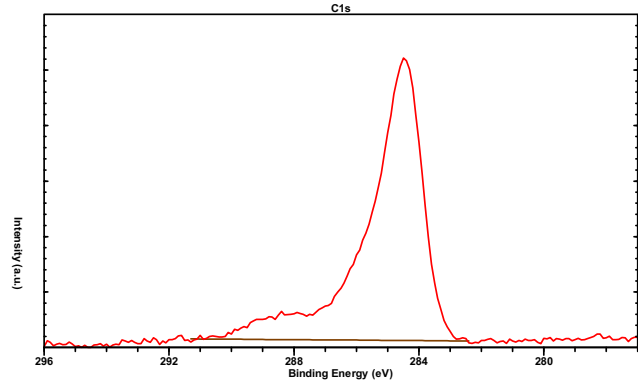
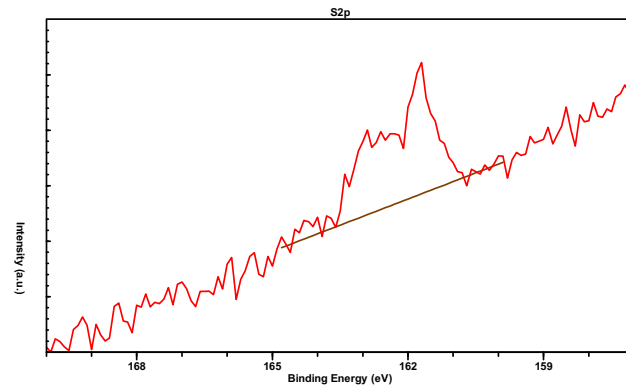
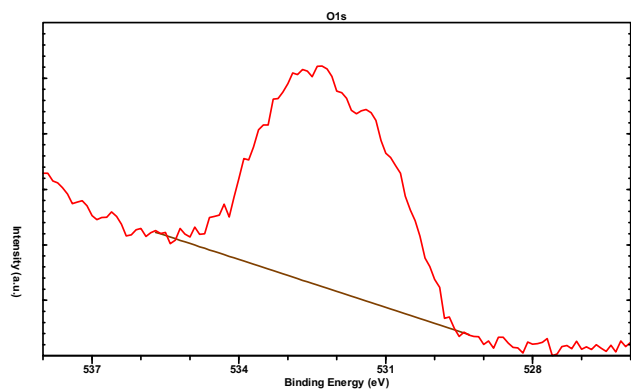
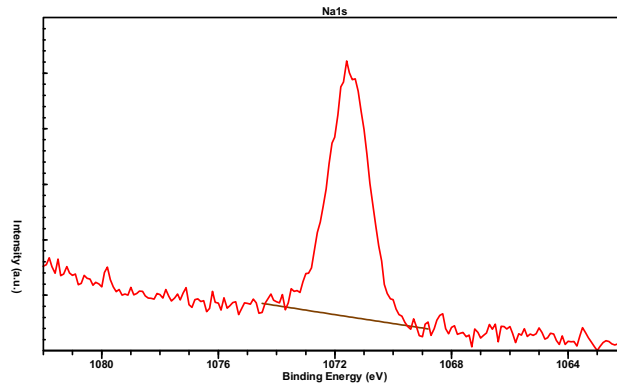
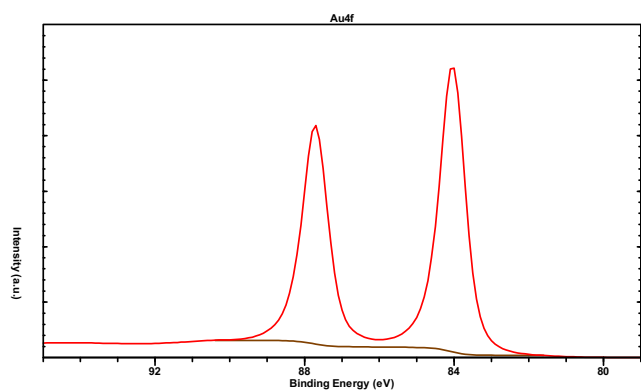
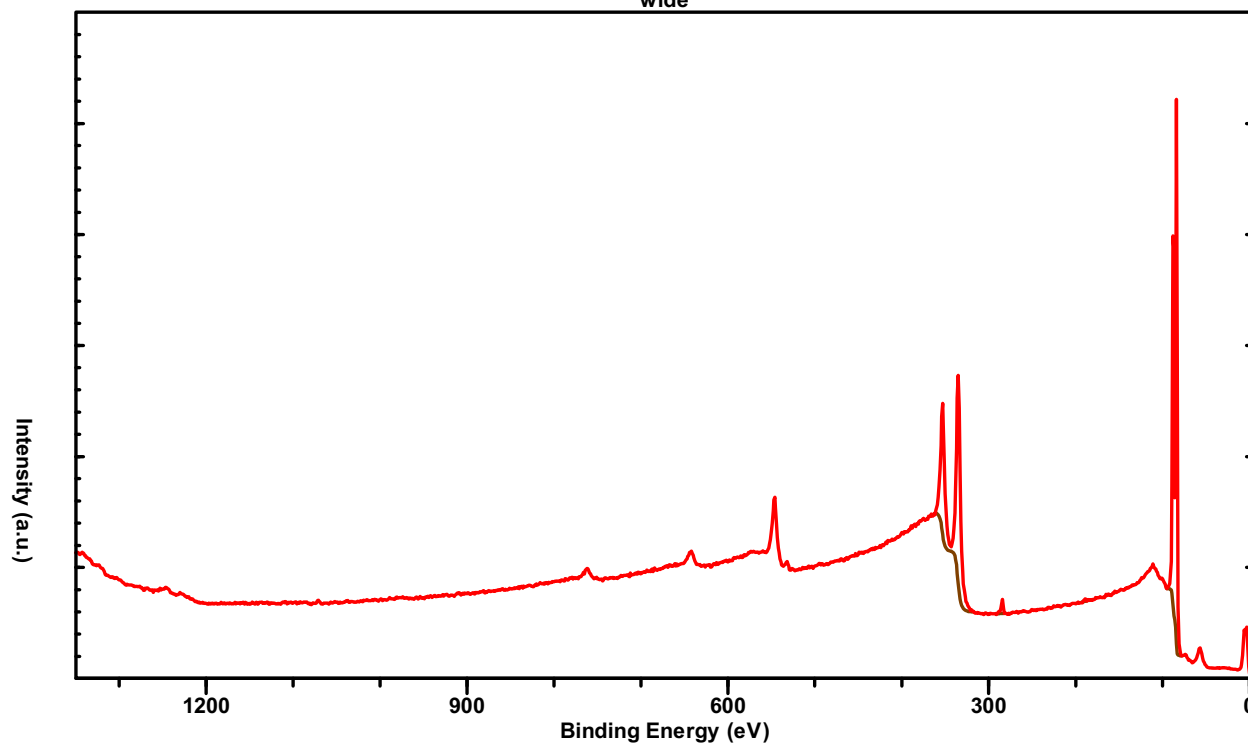
SAM of M9-COOH

wide



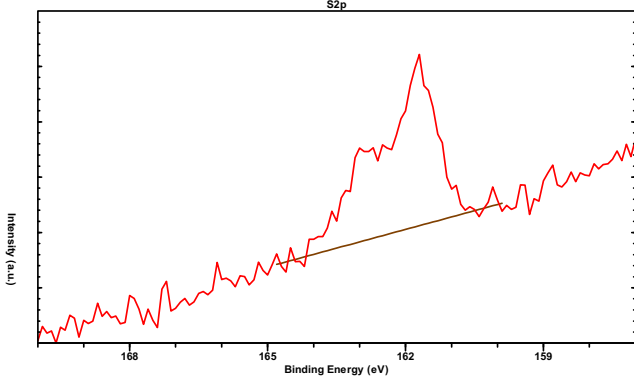
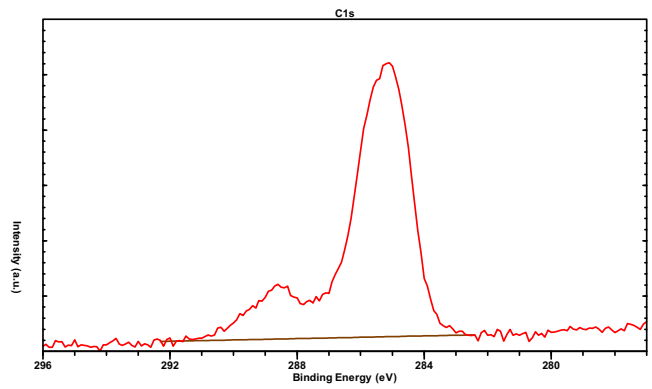
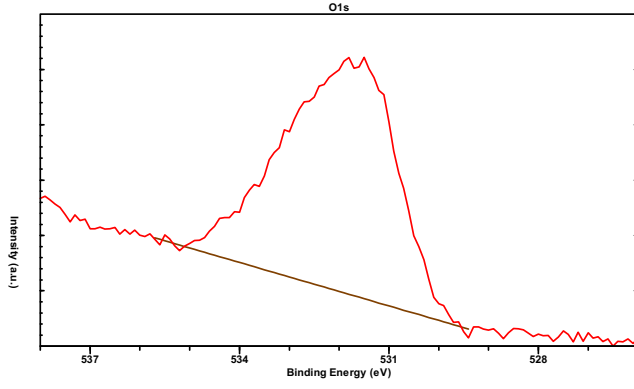
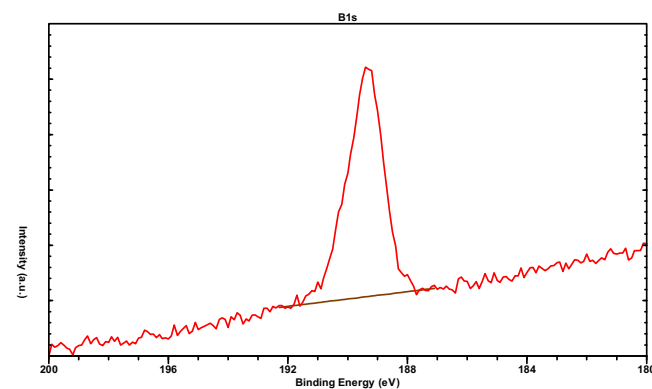
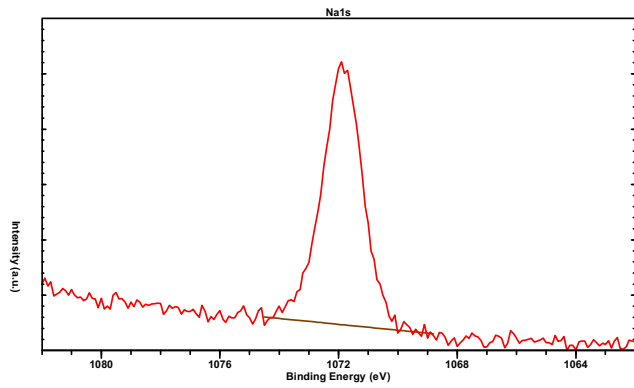
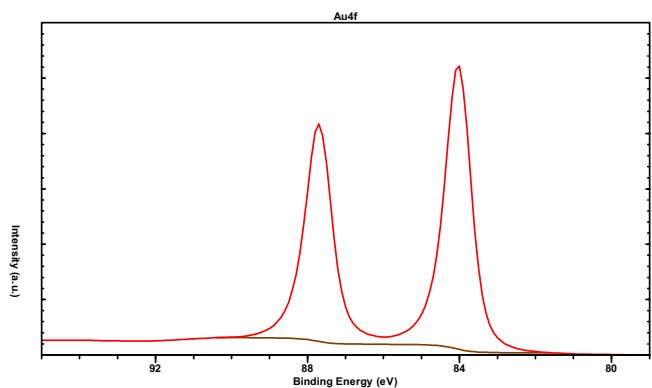
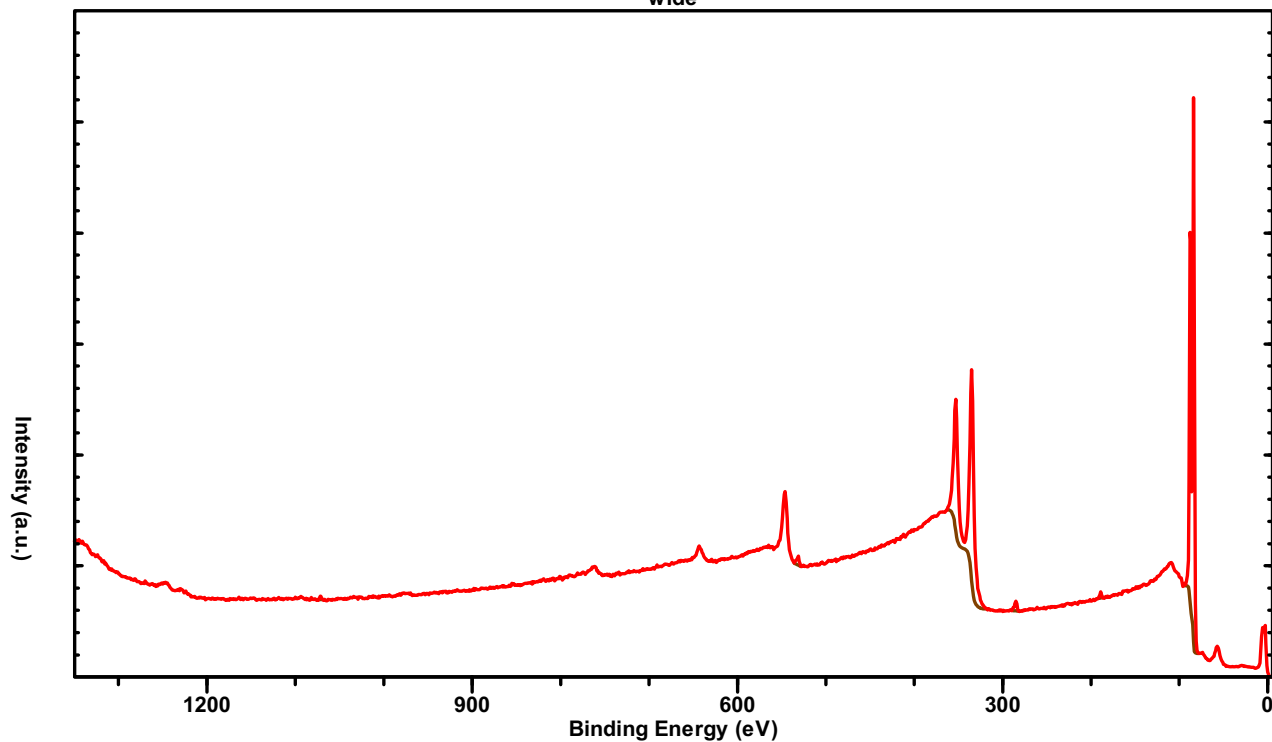
SAM of M9-COOH + H₃O⁺

wide



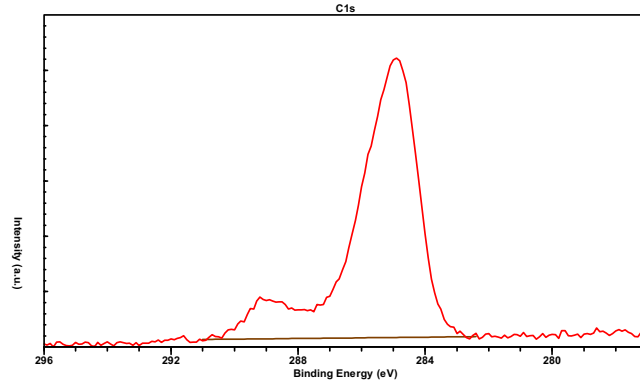
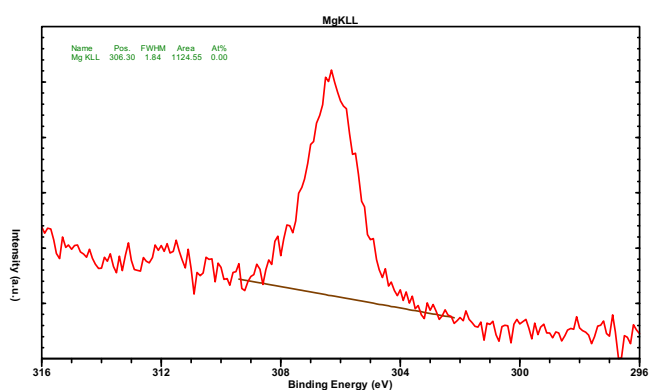
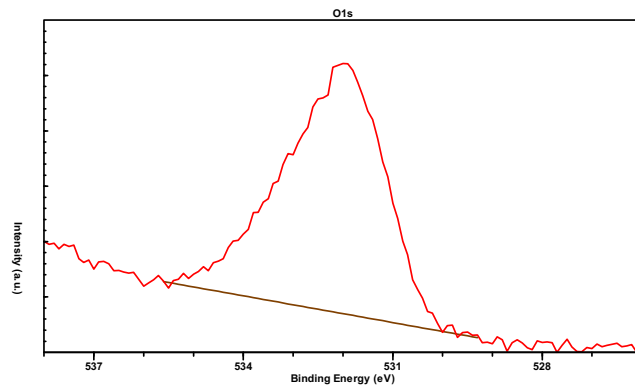
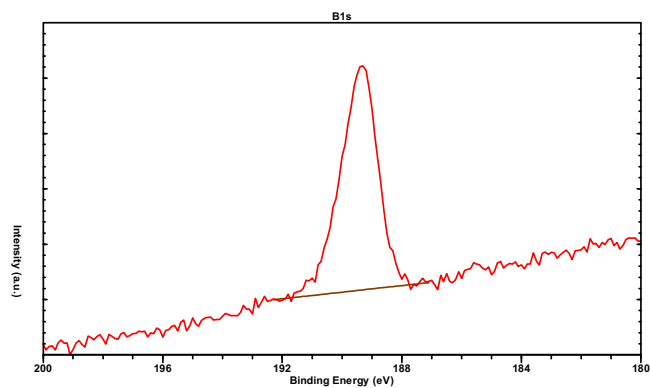
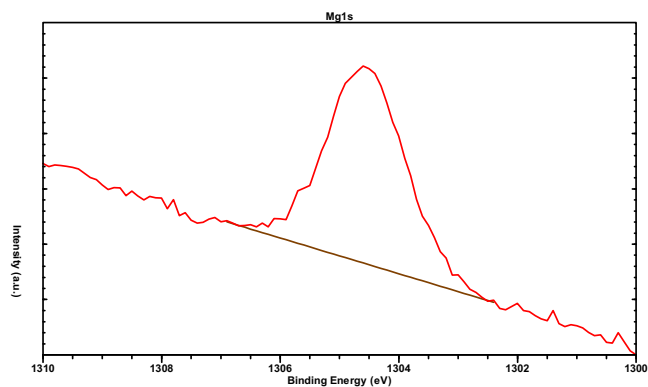
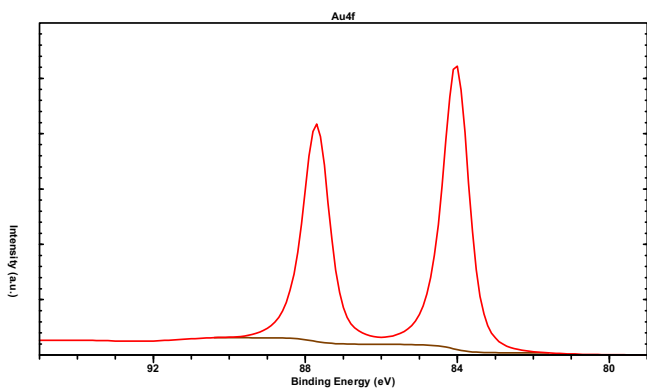
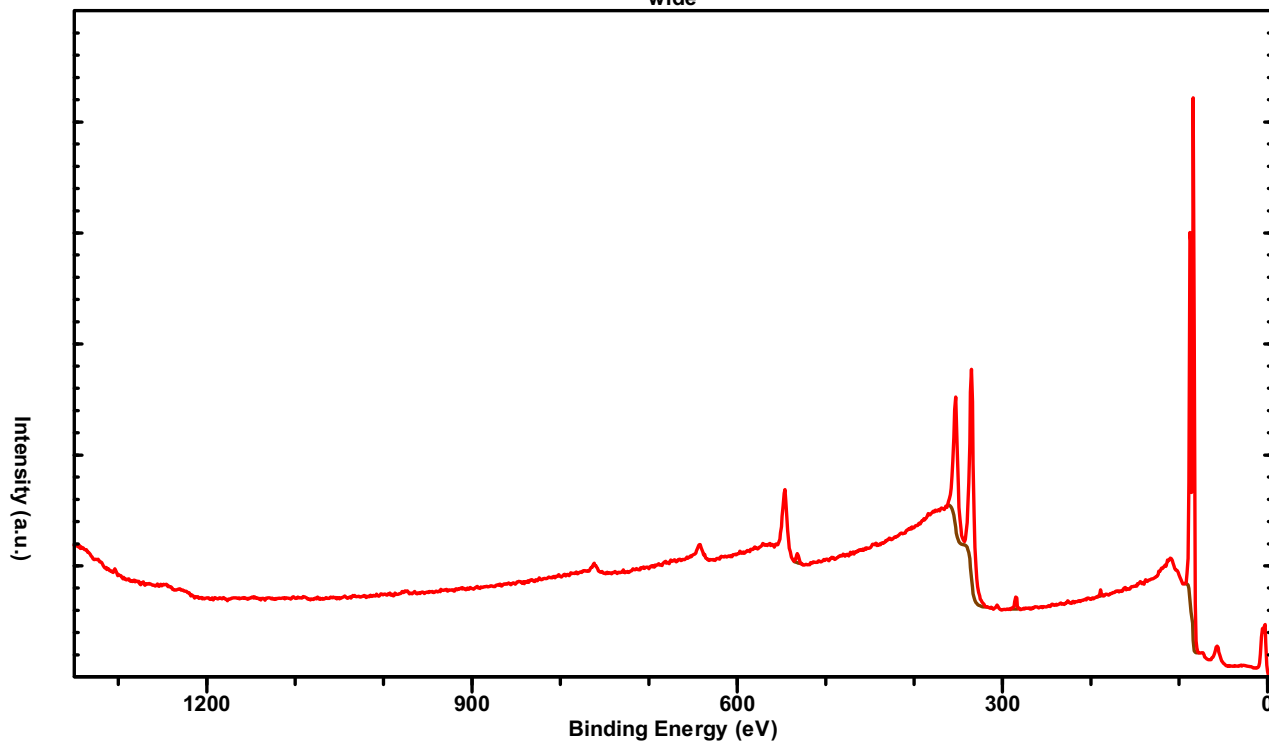
SAM of M9-COOH + Na(I)

wide

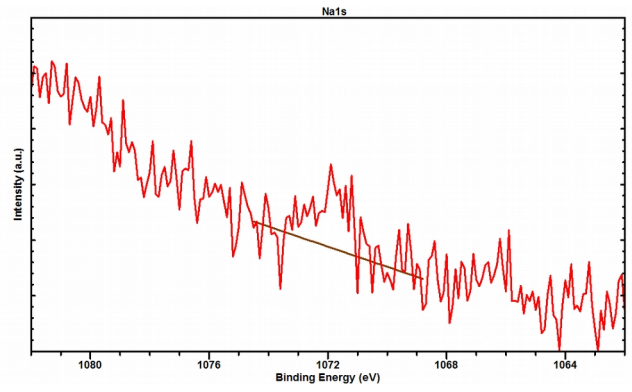
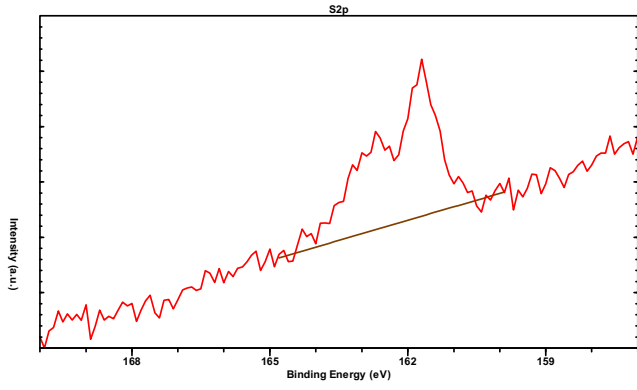


SAM of M9-COOH + Mg(II)

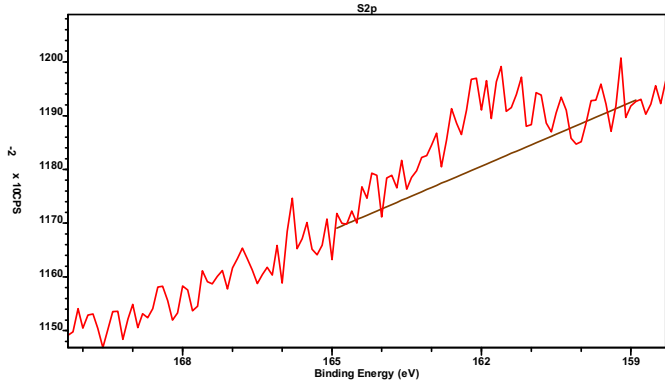
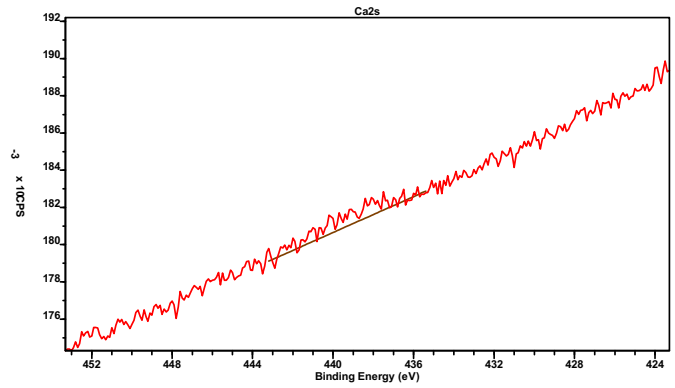
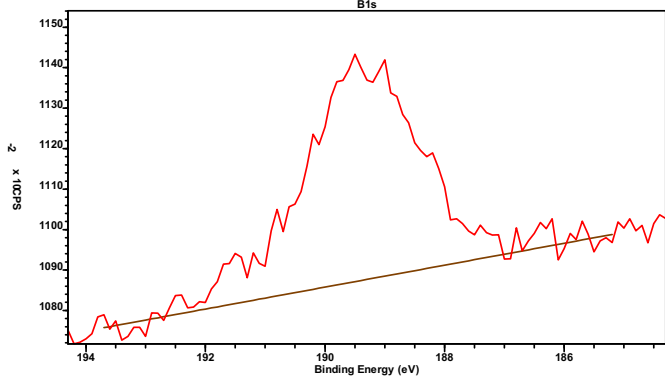
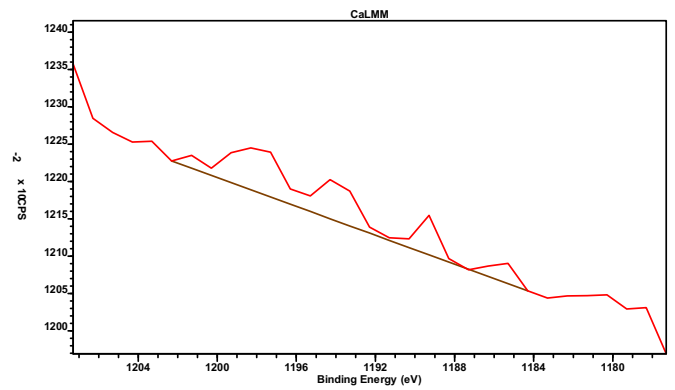
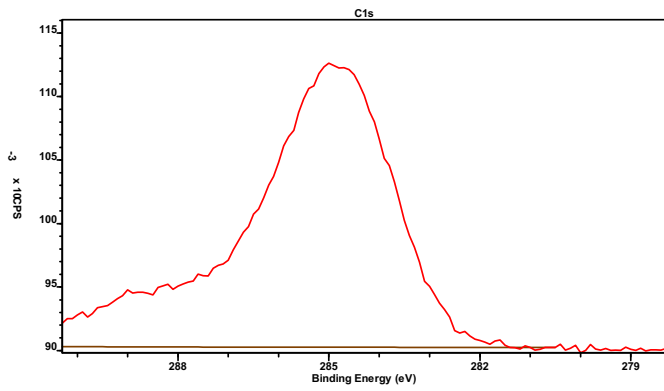
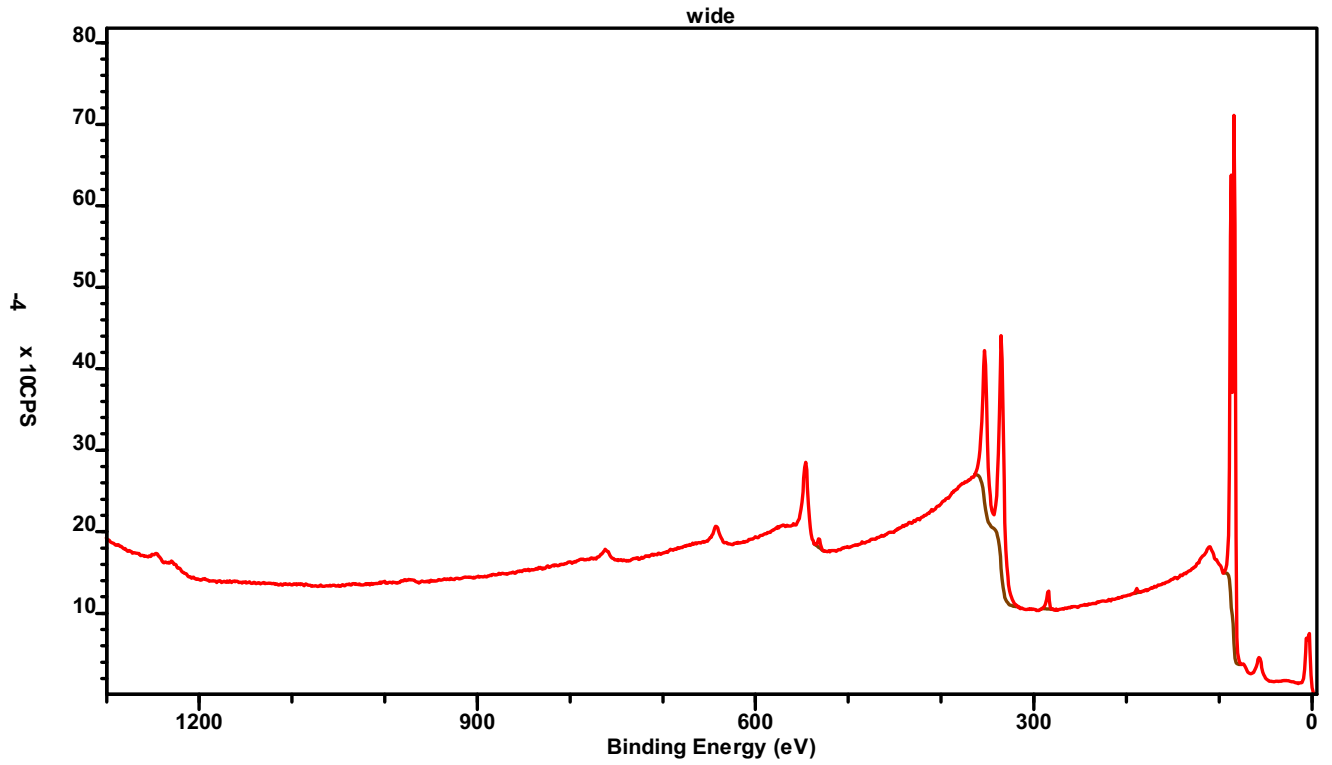
wide



SAM of M9-COOH + Mg(II)

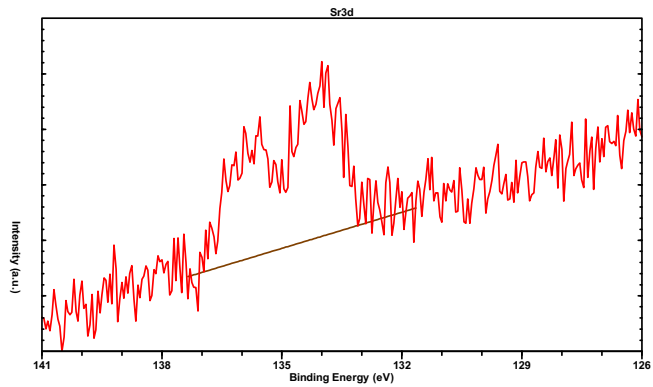
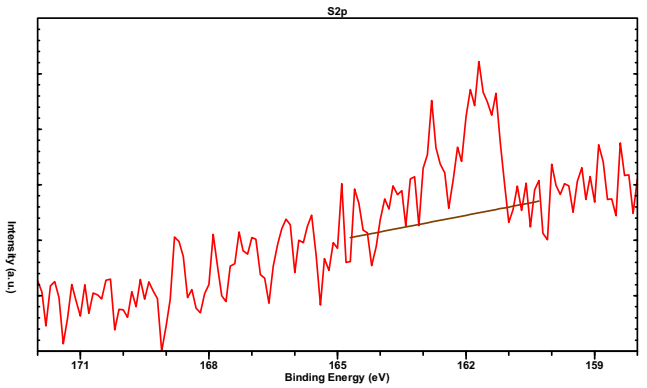
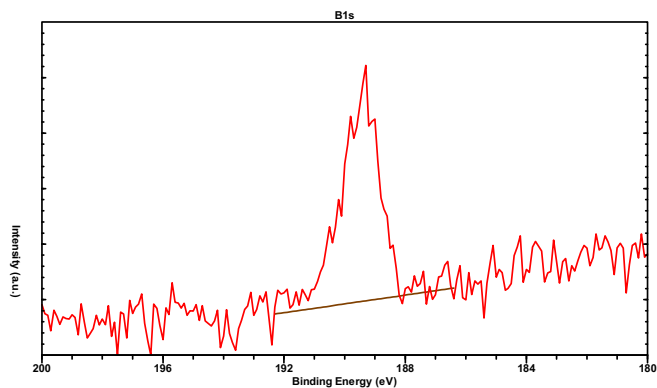
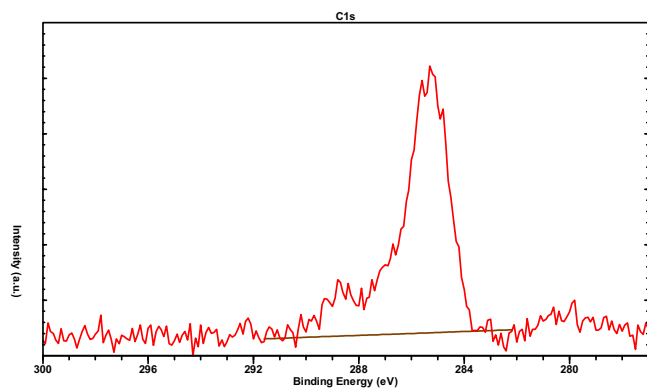
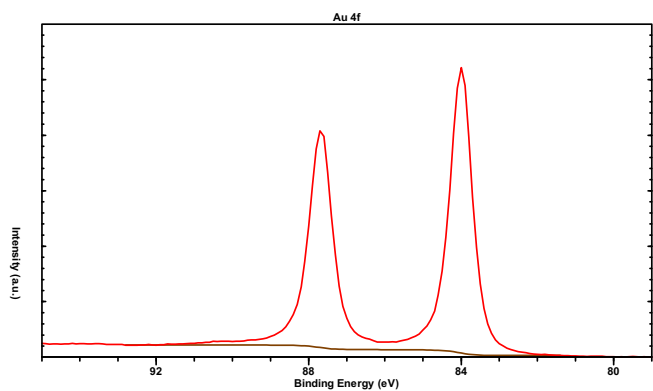
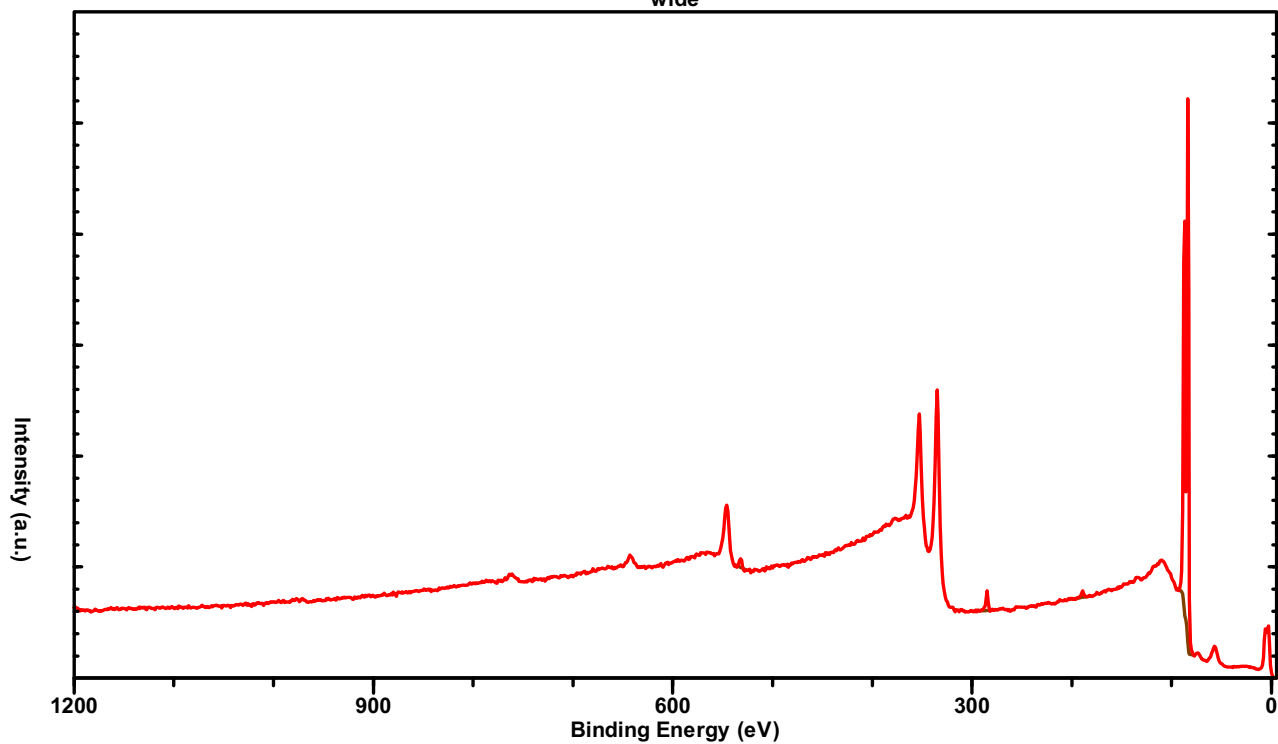


SAM of M9-COOH + Ca(II)



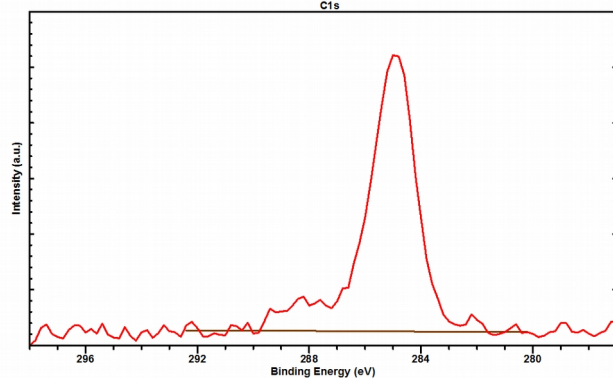
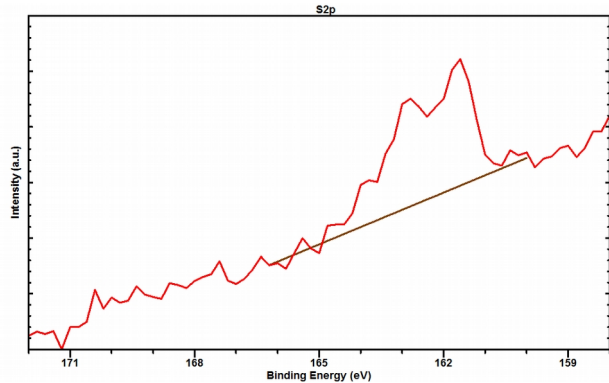
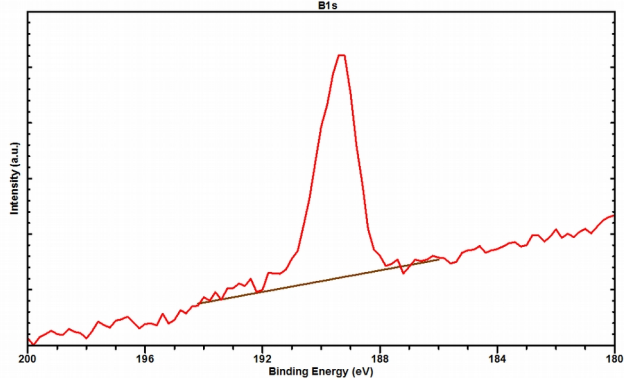
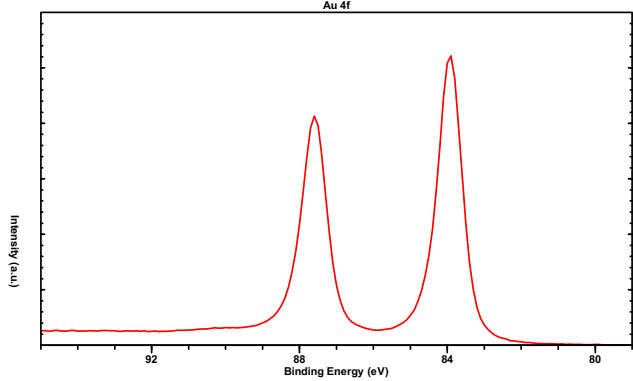
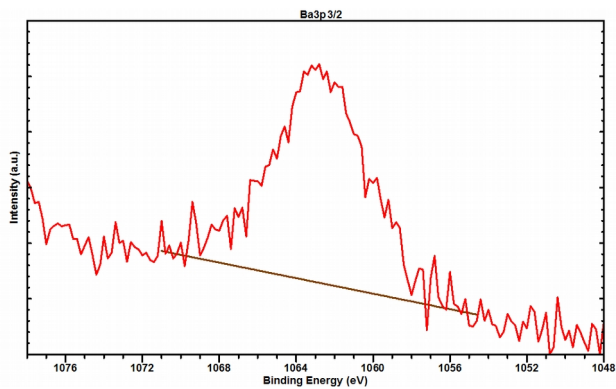
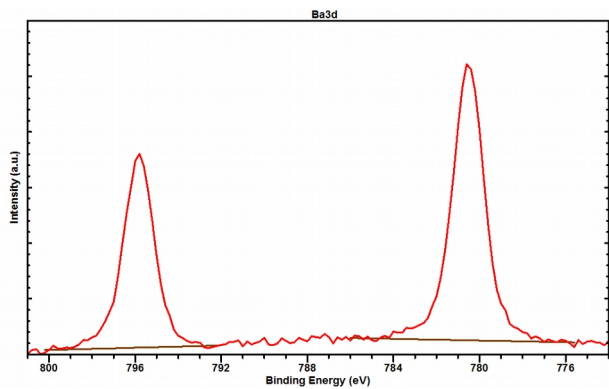
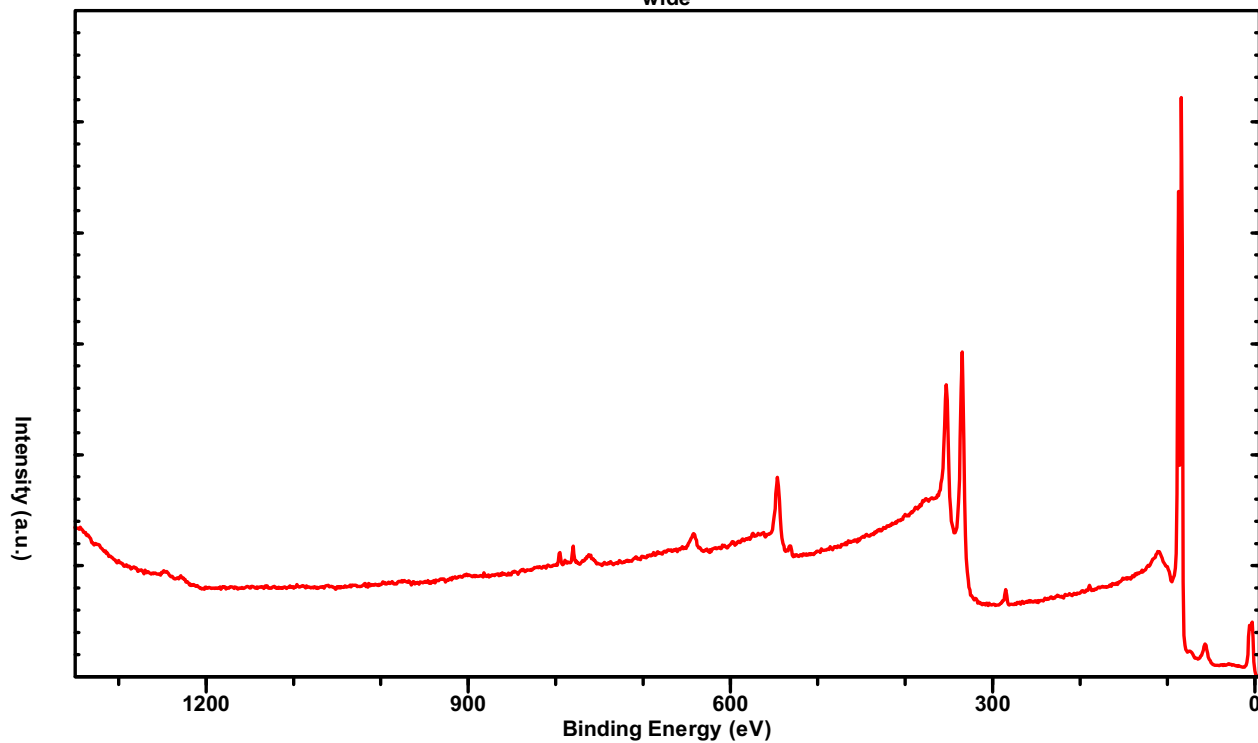
SAM of M9-COOH + Sr(II)

wide

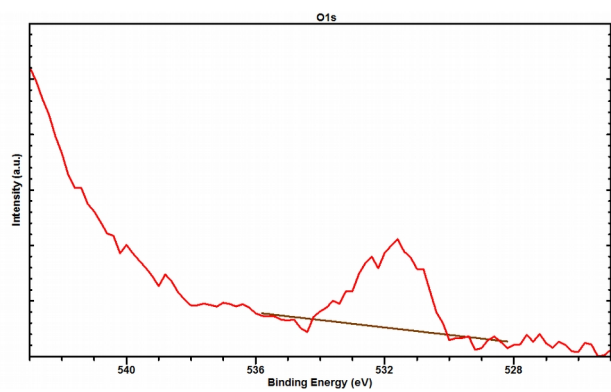


SAM of M9-COOH + Ba(II)

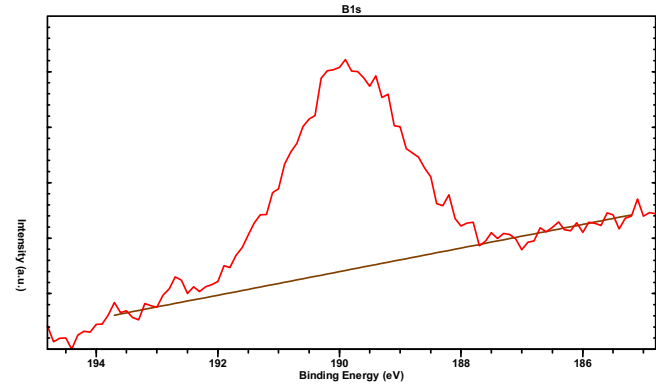
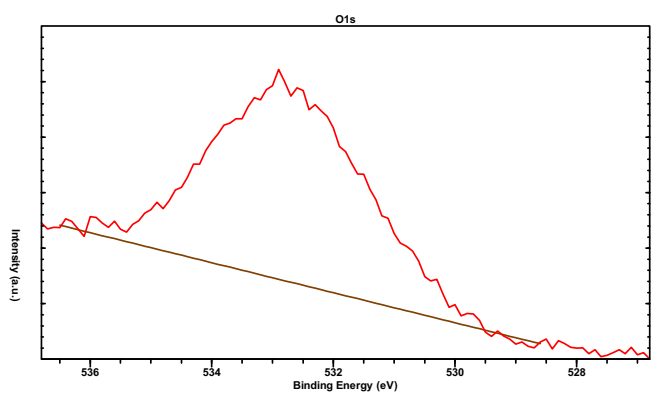
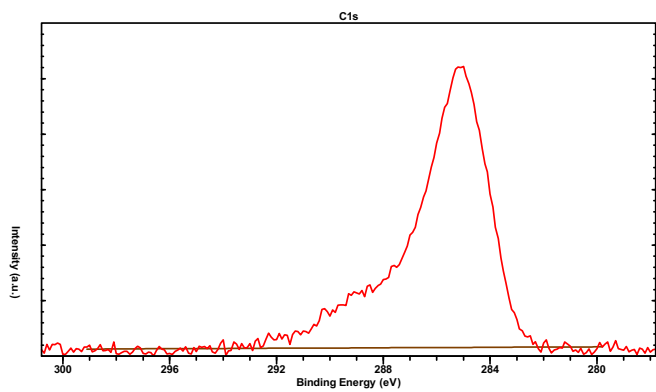
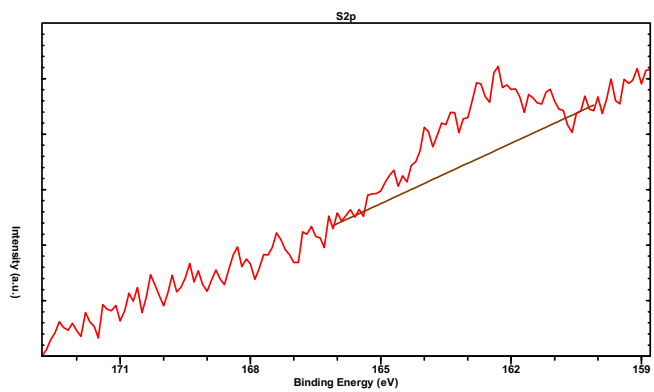
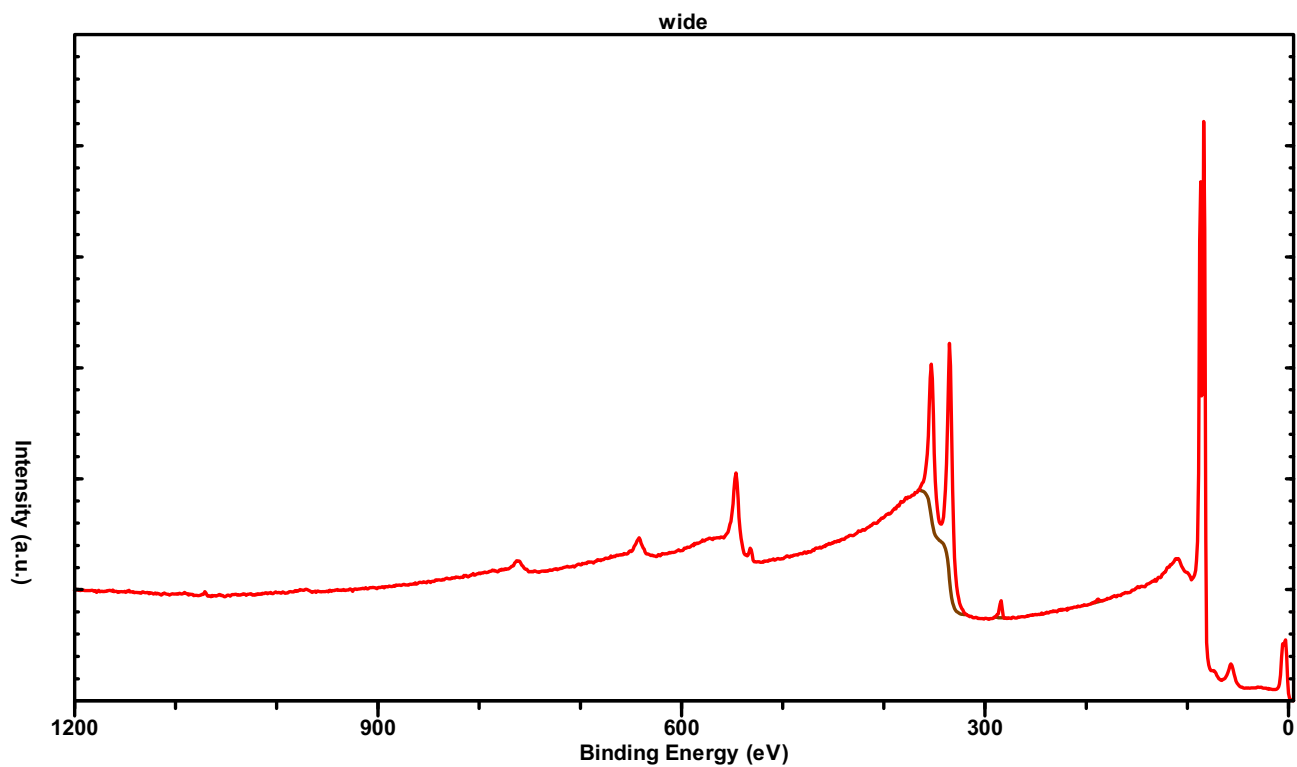
wide



SAM of M9-COOH + Ba(II)

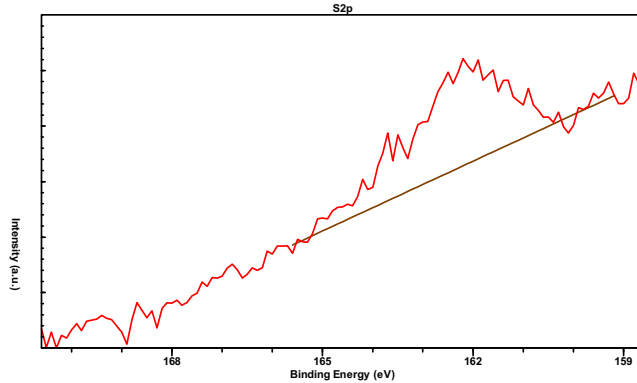
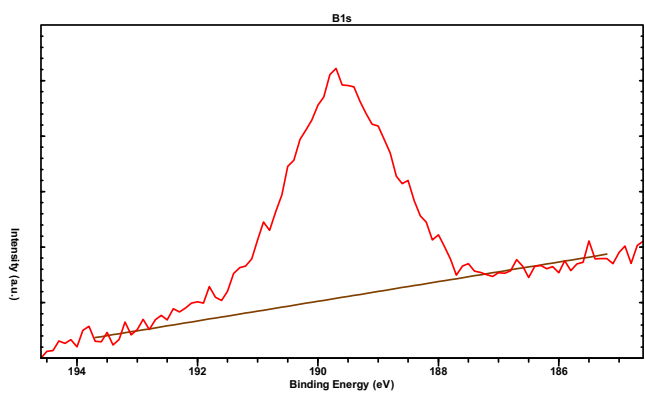
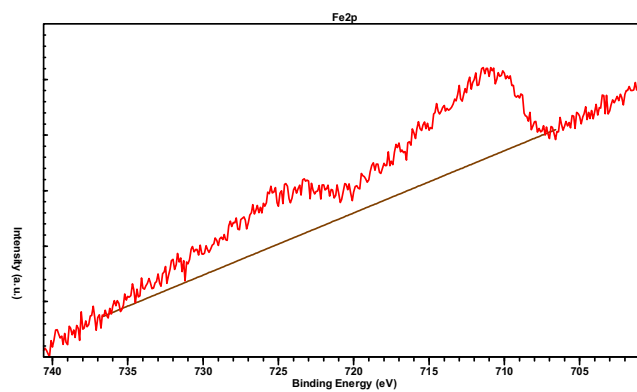
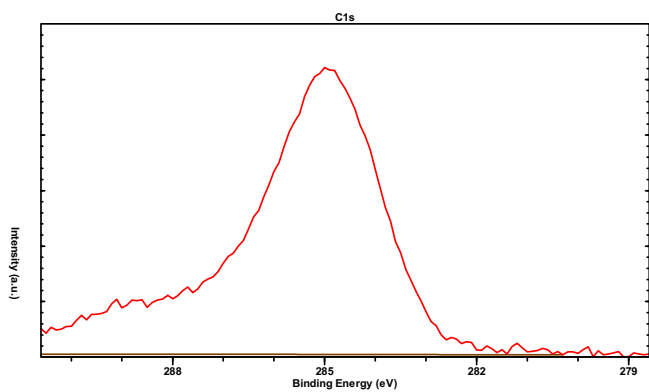
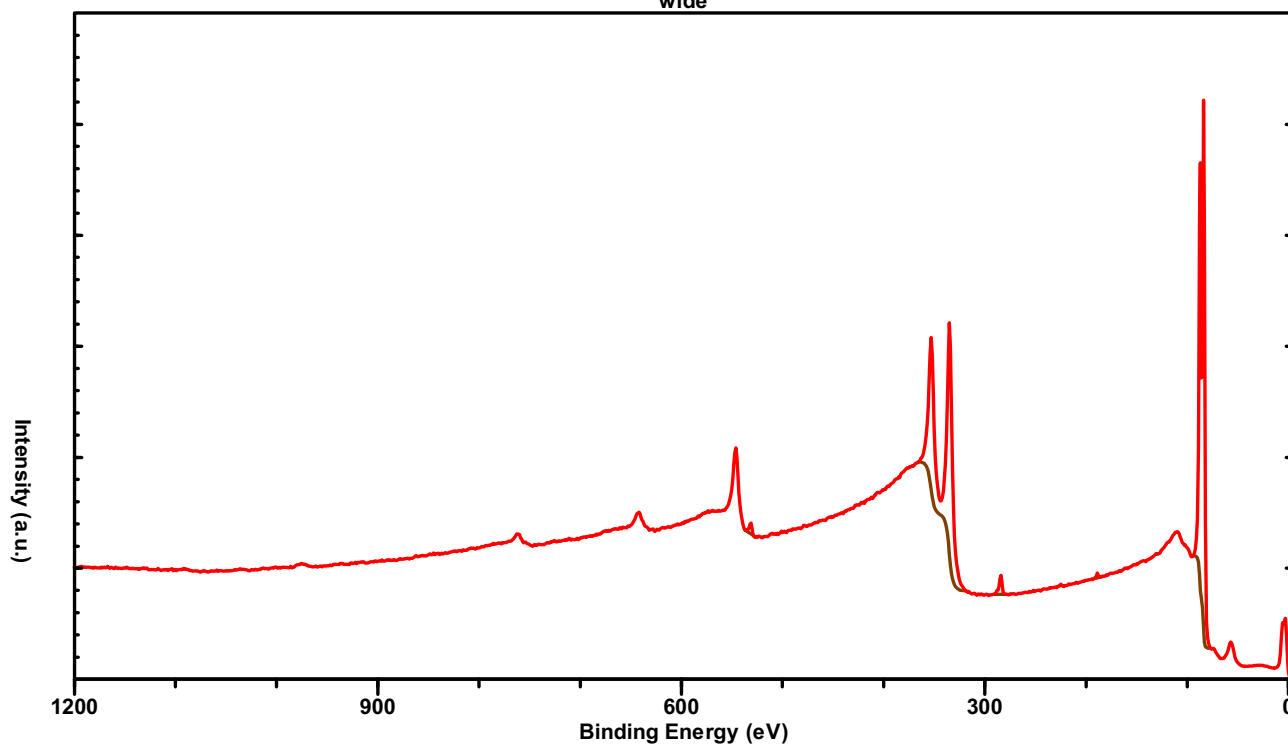


SAM of M9-COOH +Cr(III)

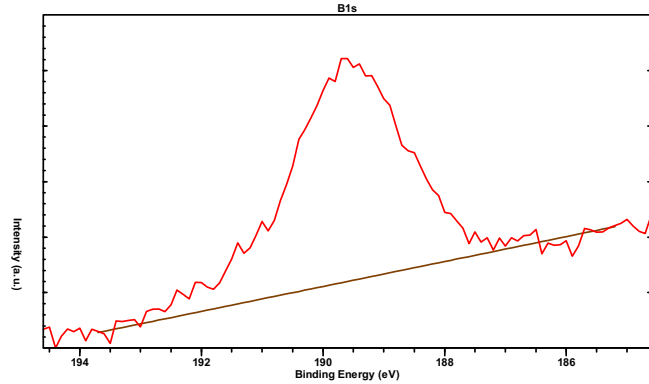
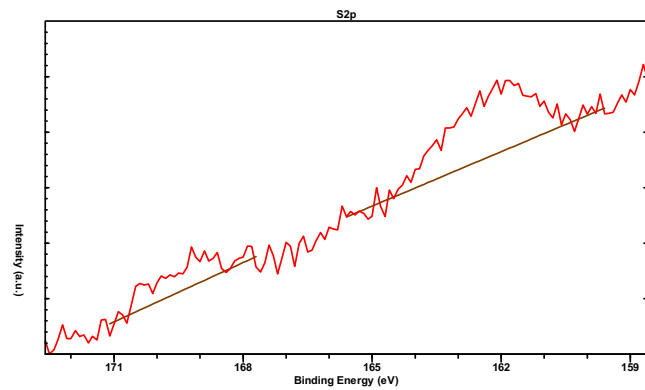
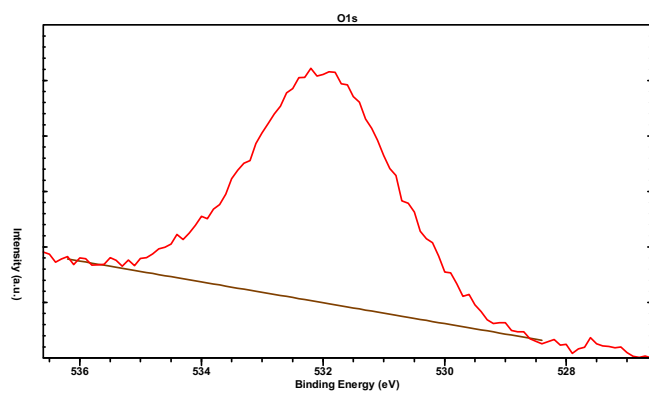
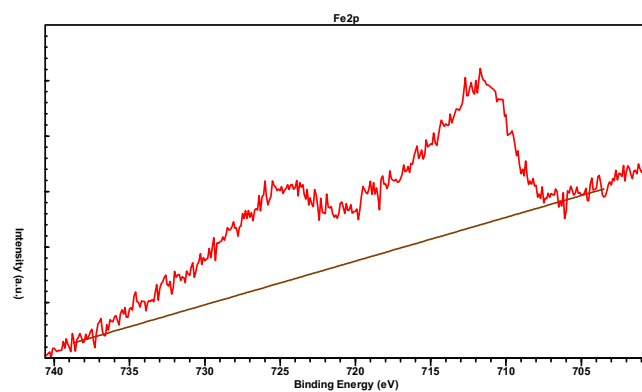
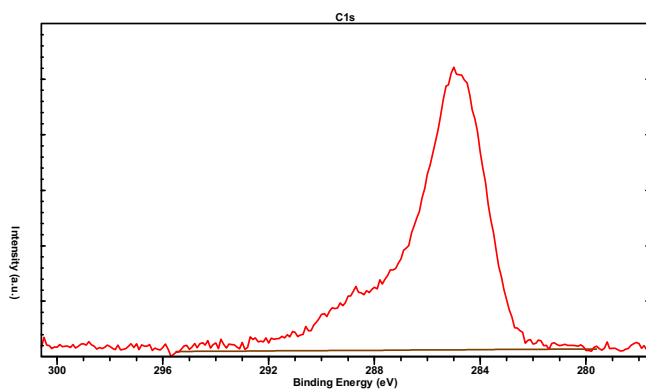
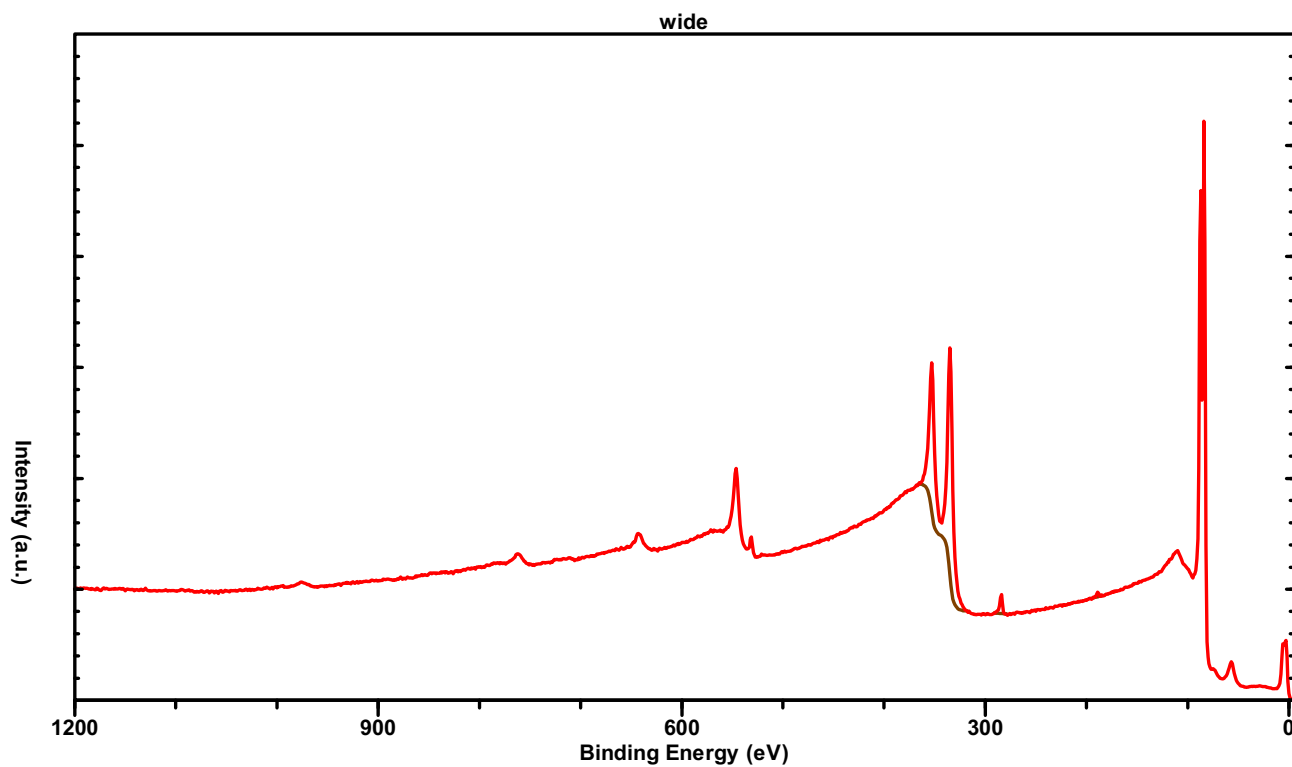


SAM of M9-COOH + Fe(II)

wide

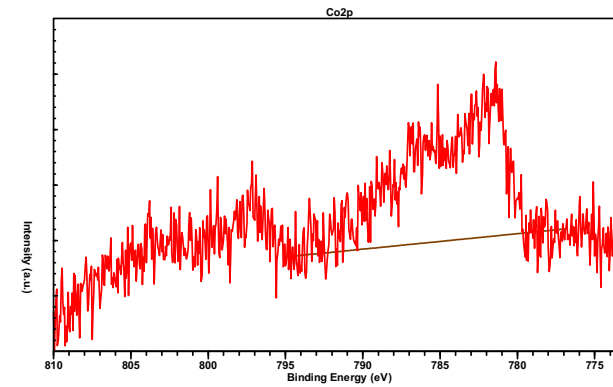
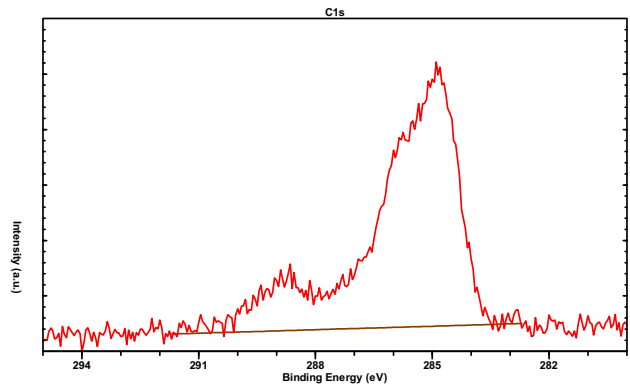
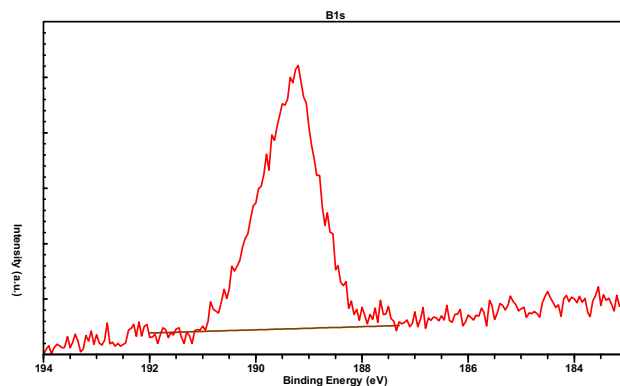
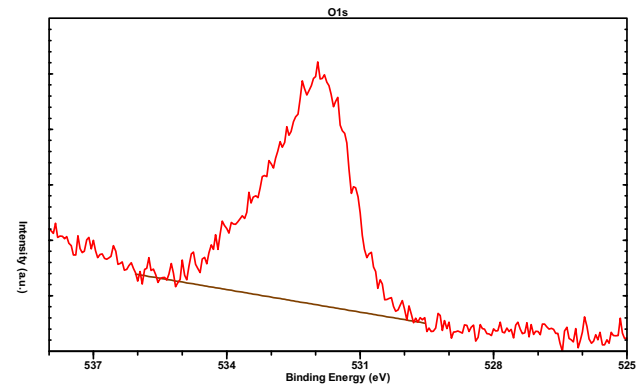
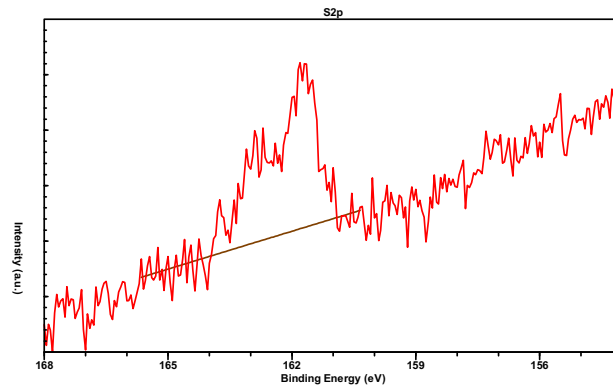
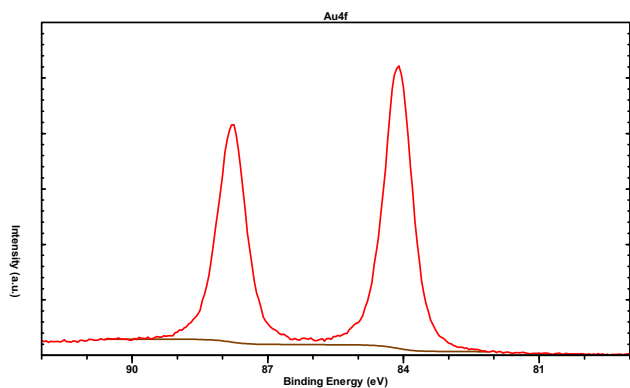
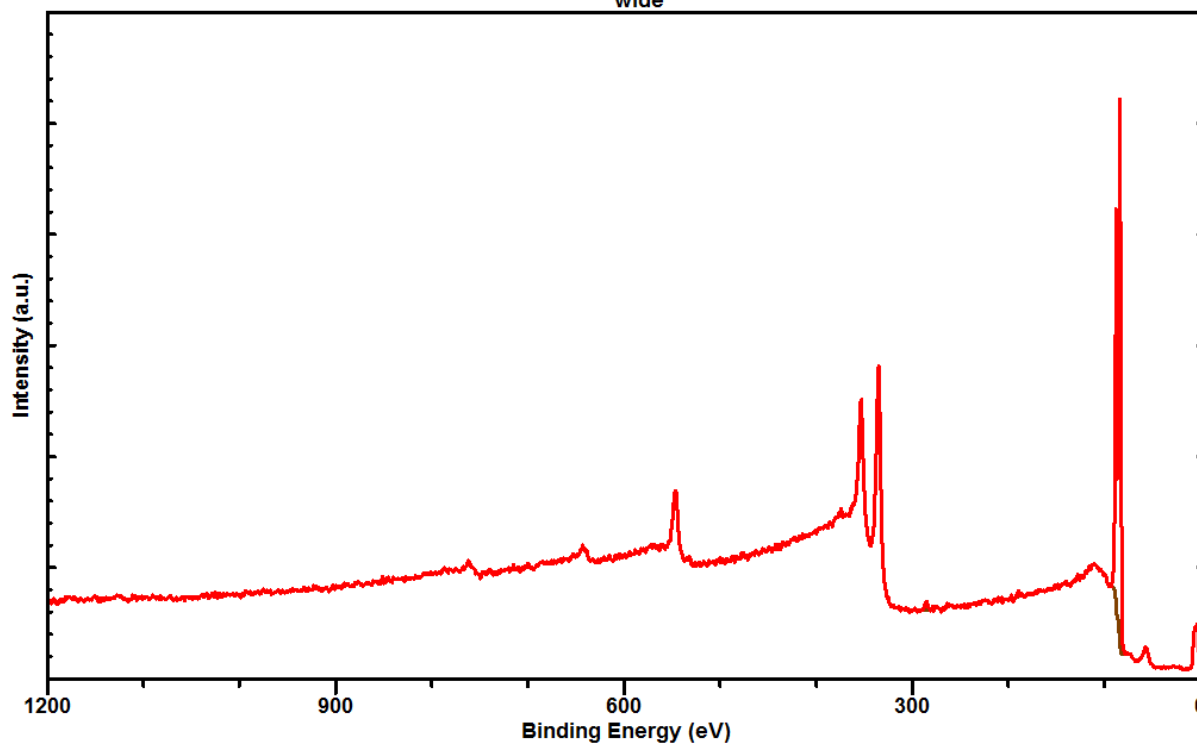


SAM of M9-COOH + Fe(III)



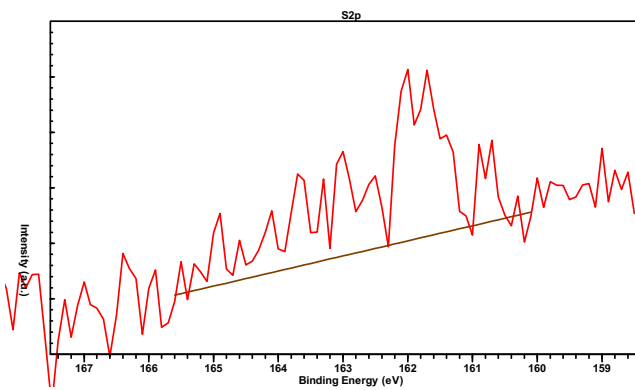
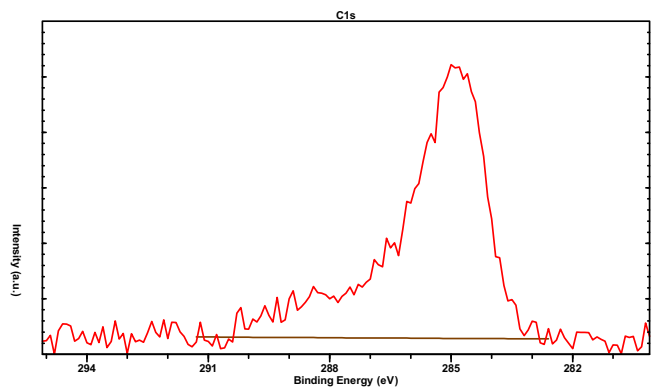
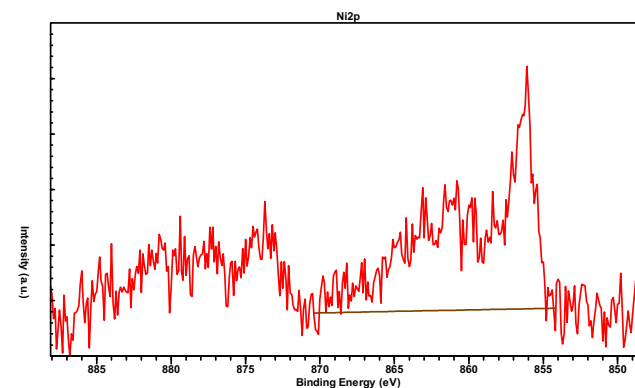
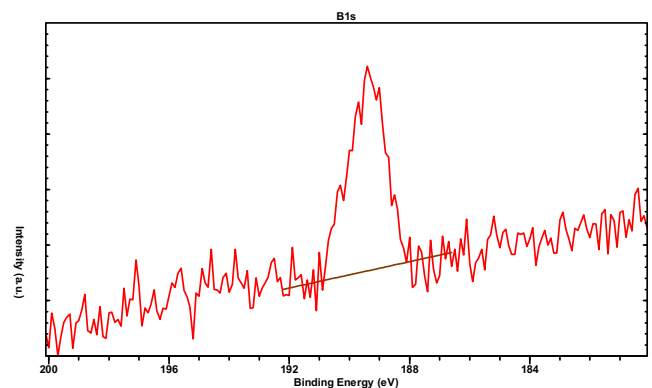
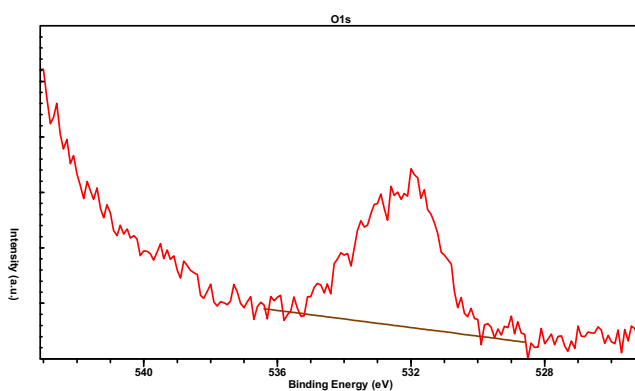
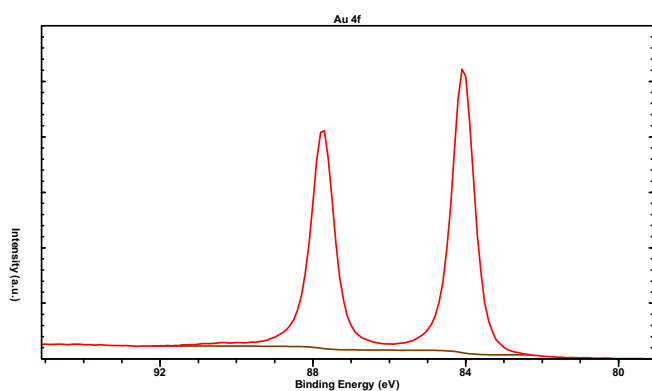
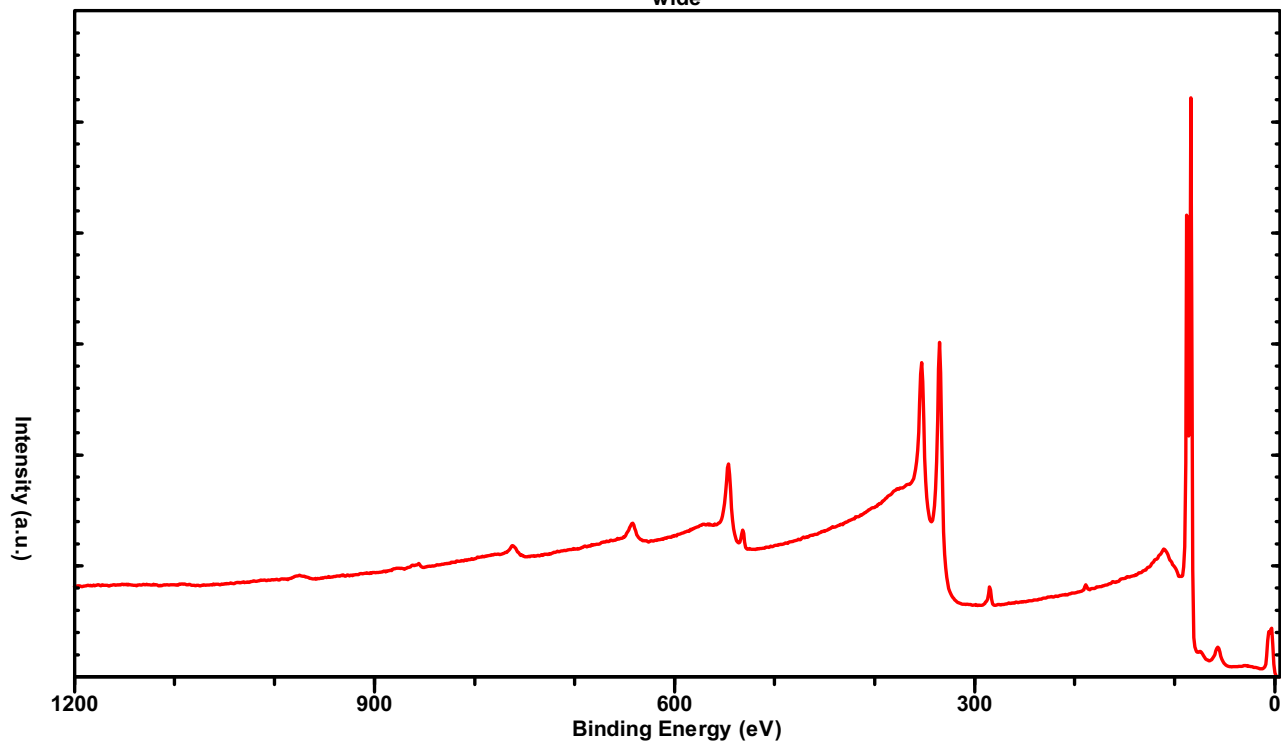
SAM of M9-COOH + Co(II)

wide

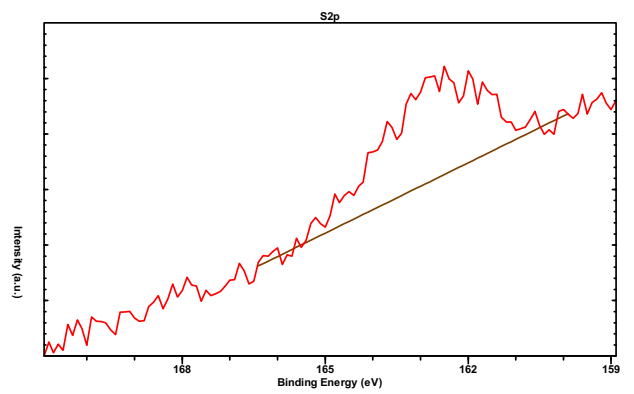
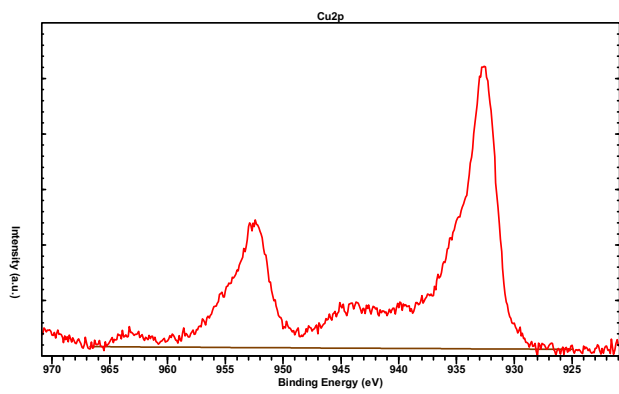
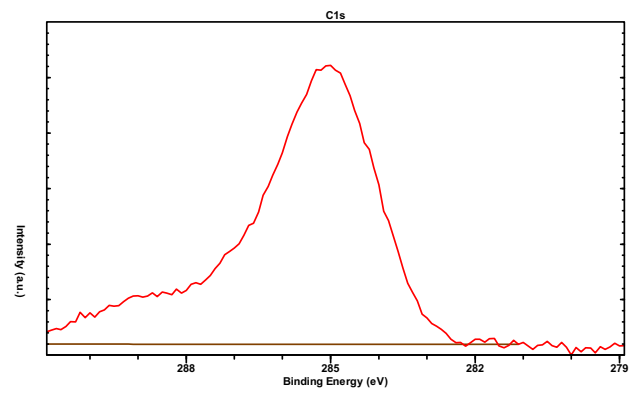
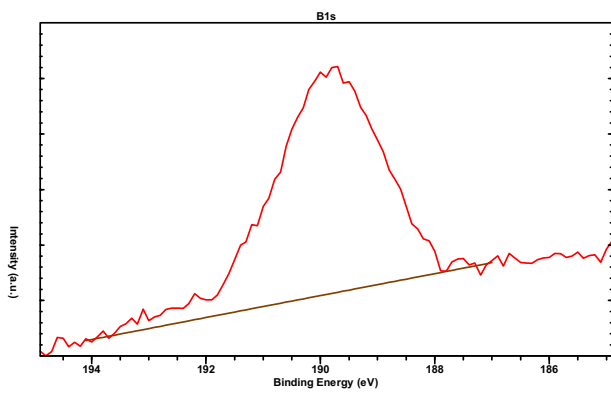
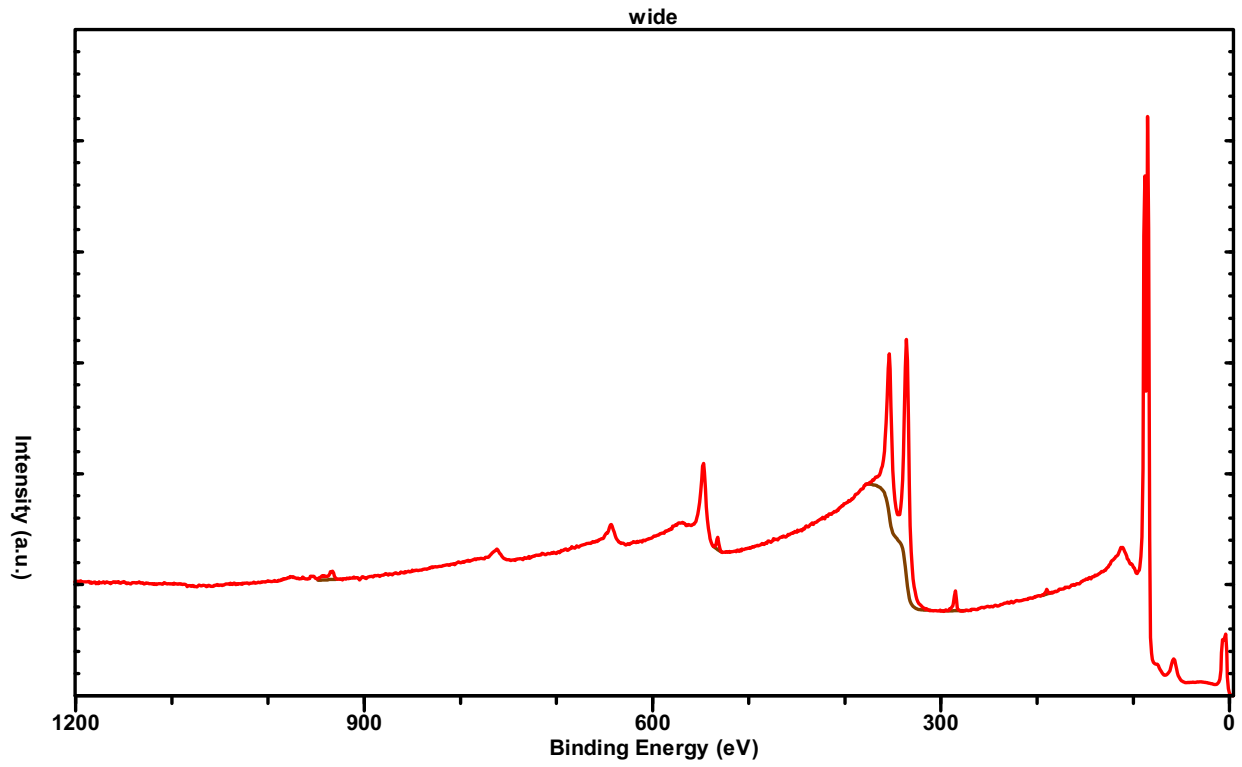


SAM of M9-COOH + Ni(II)

wide

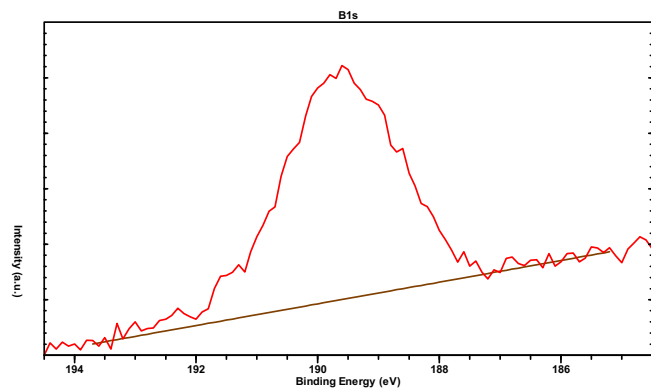
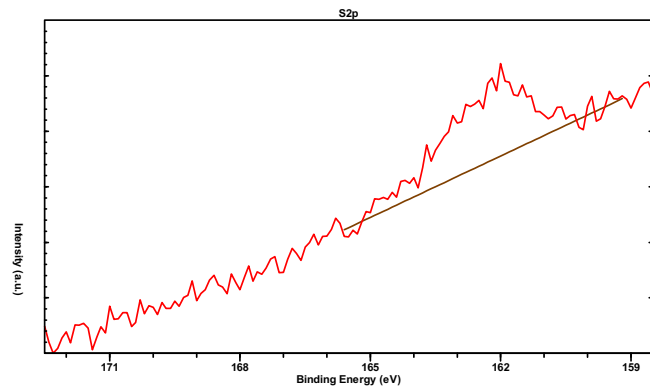
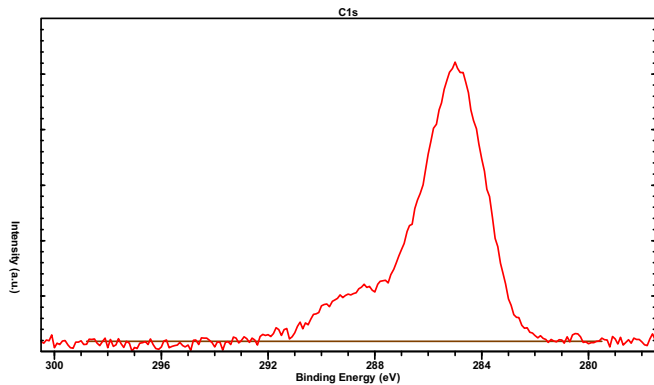
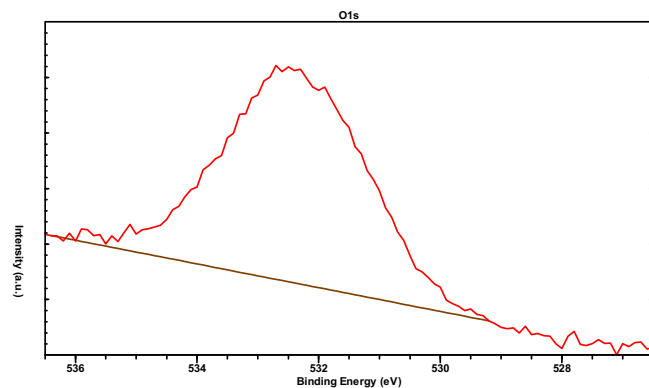
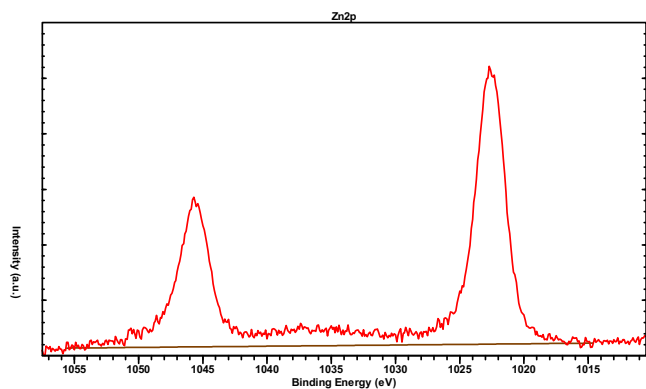
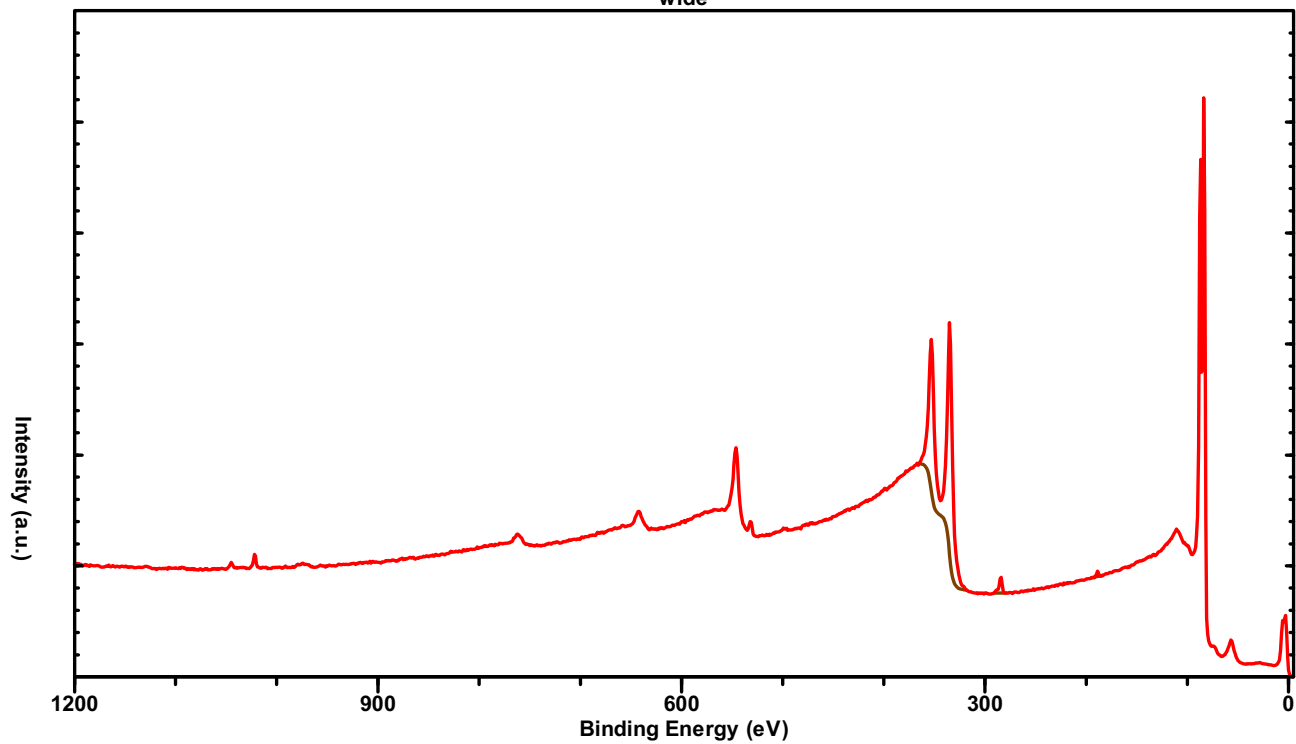


SAM of M9-COOH + Cu(II)



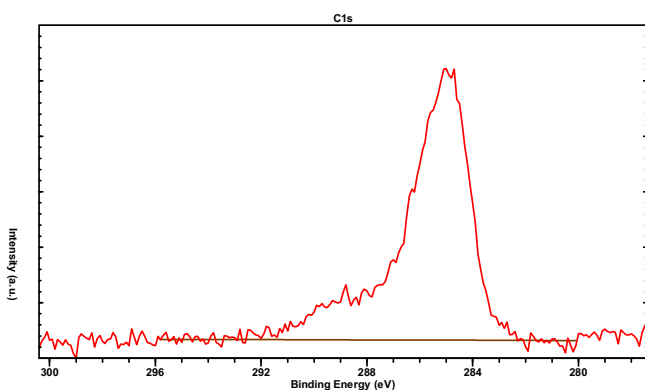
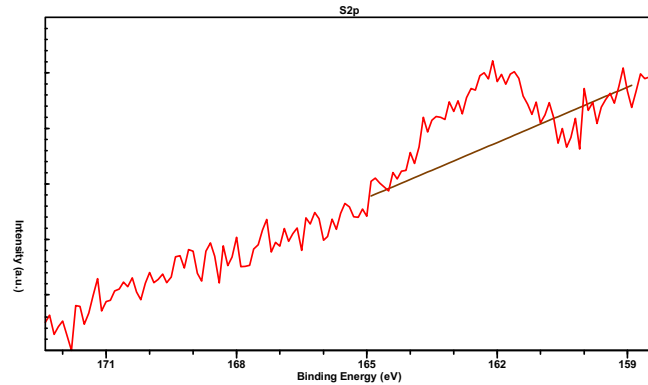
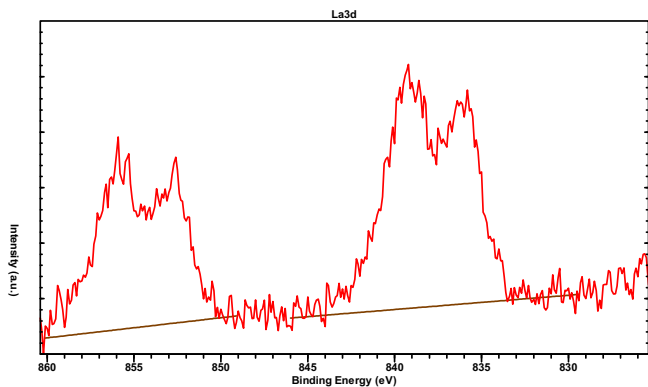
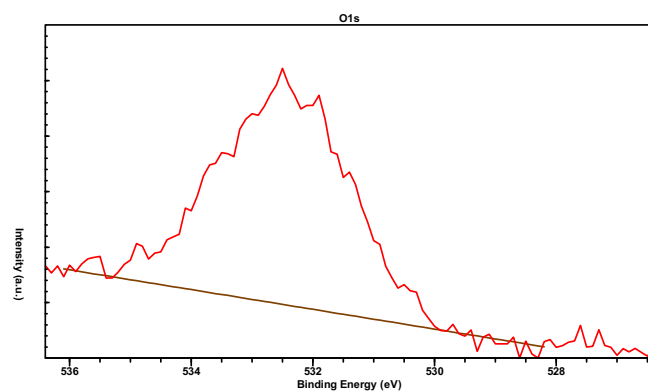
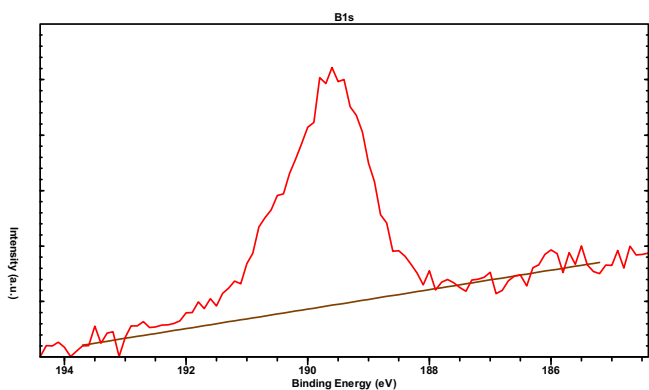
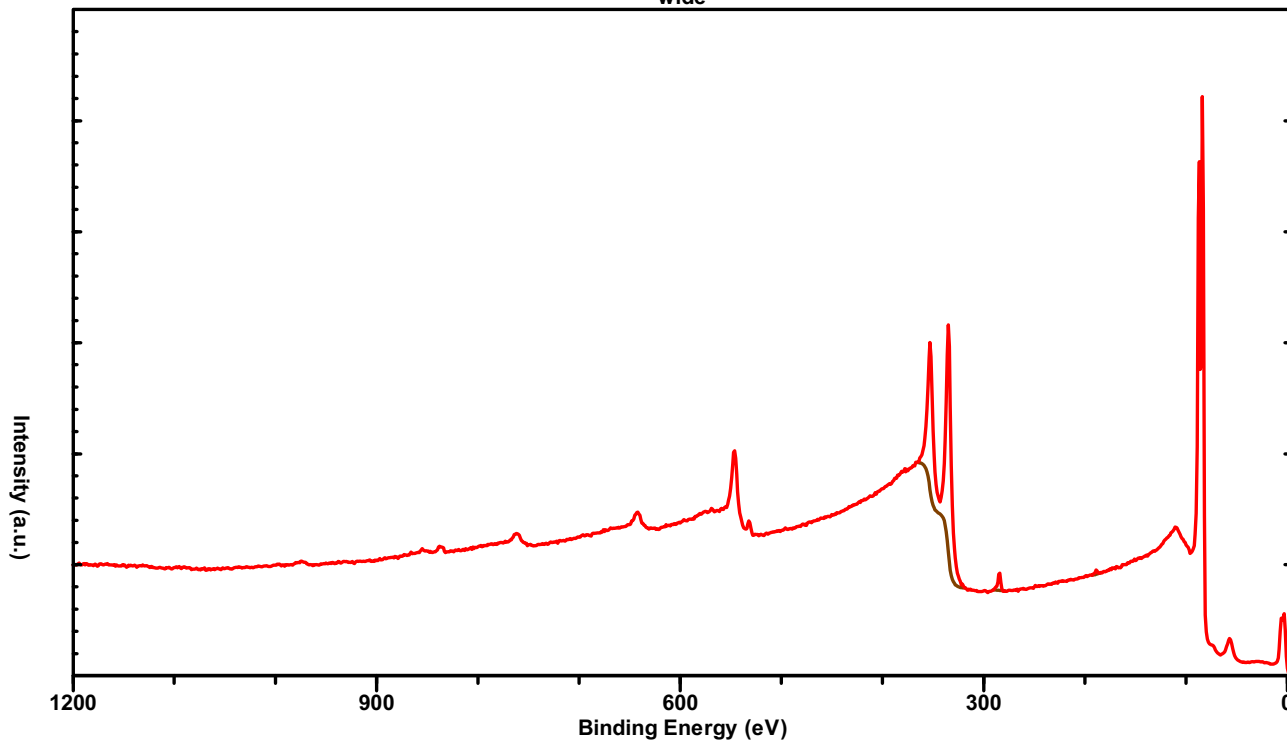
SAM of M9-COOH + Zn(II)

wide



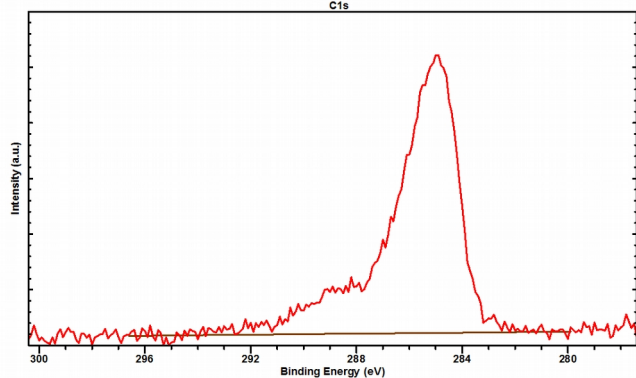
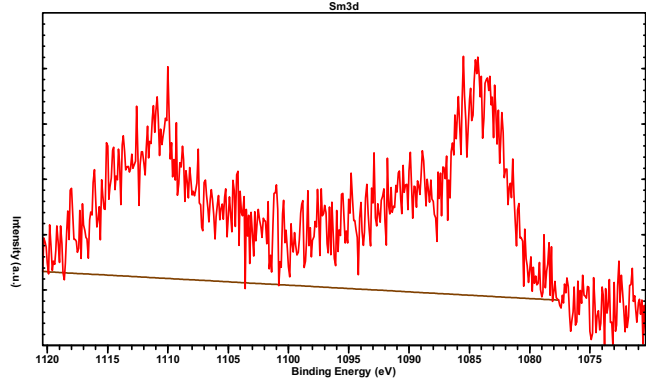
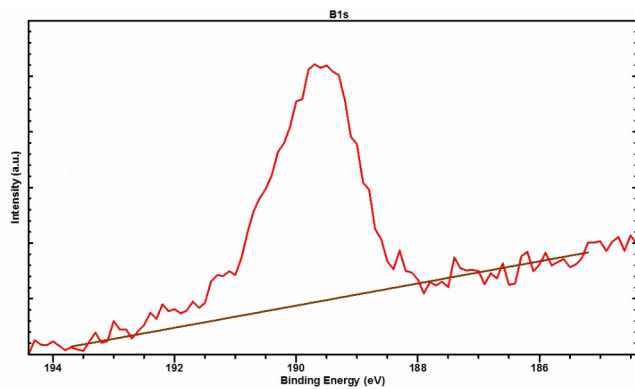
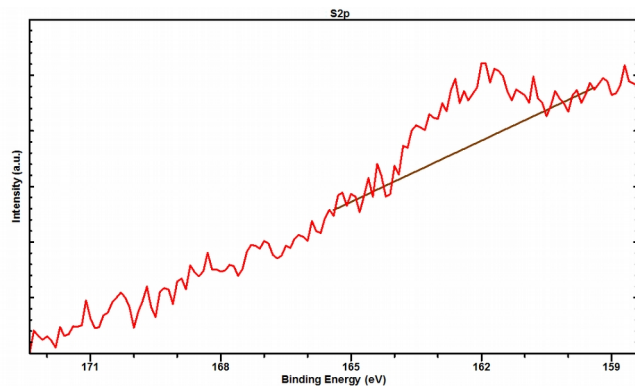
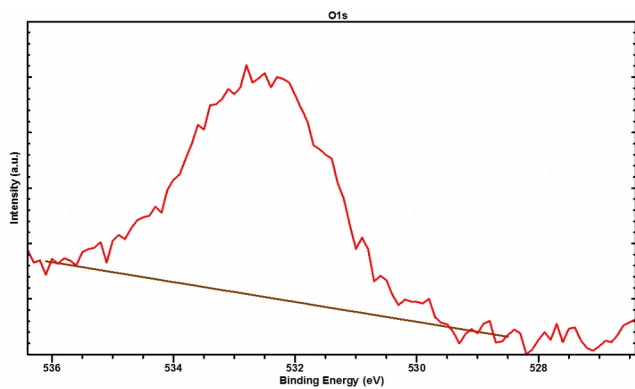
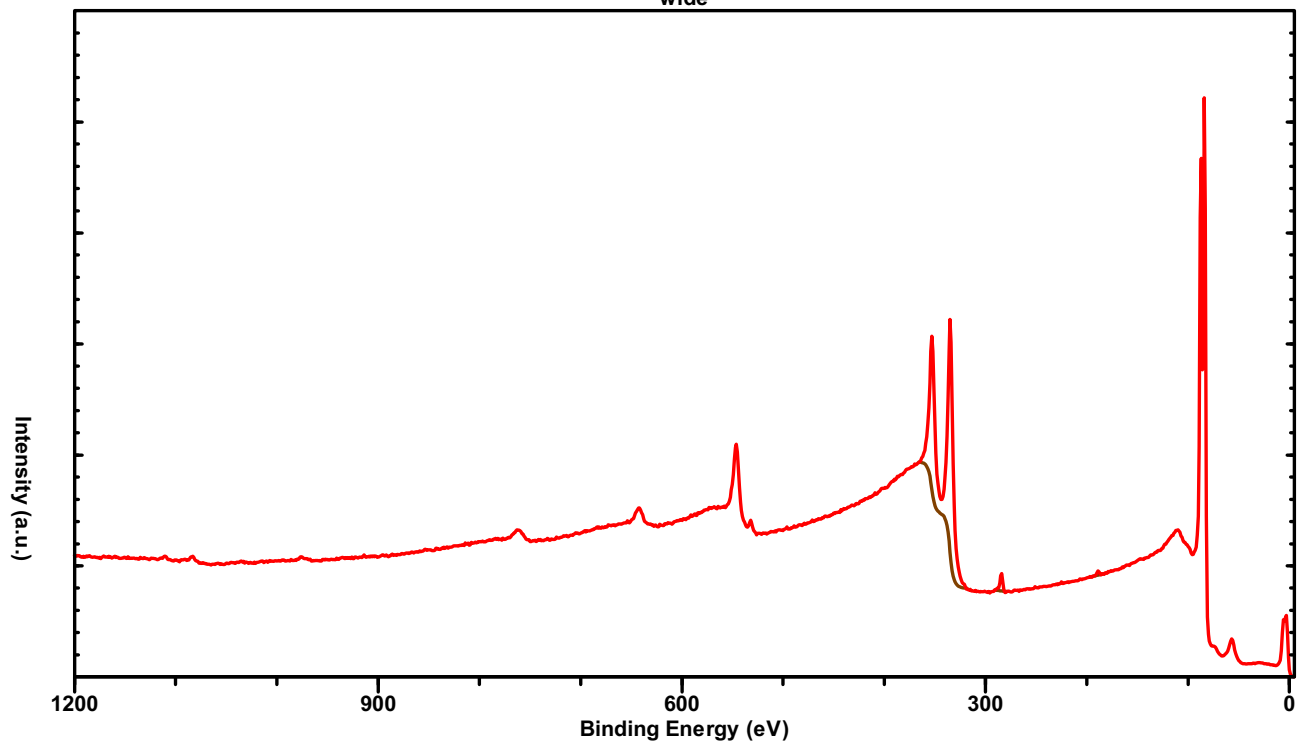
SAM of M9-COOH + La(III)

wide



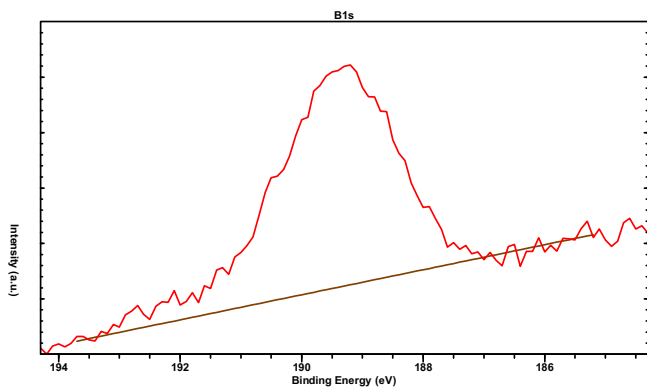
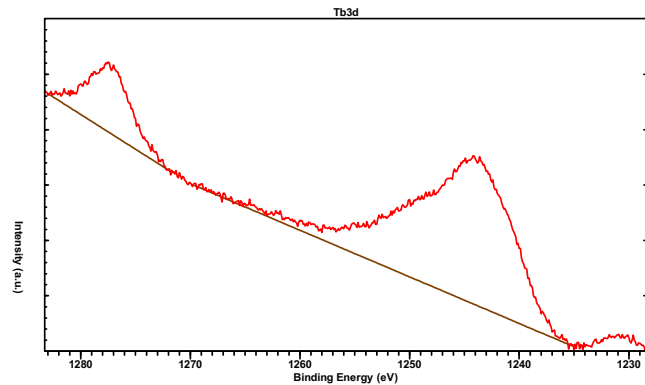
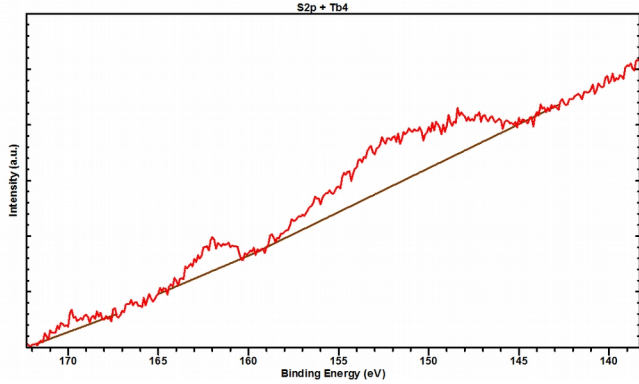
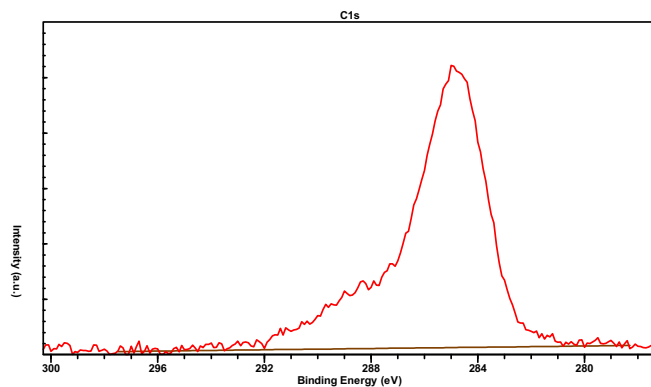
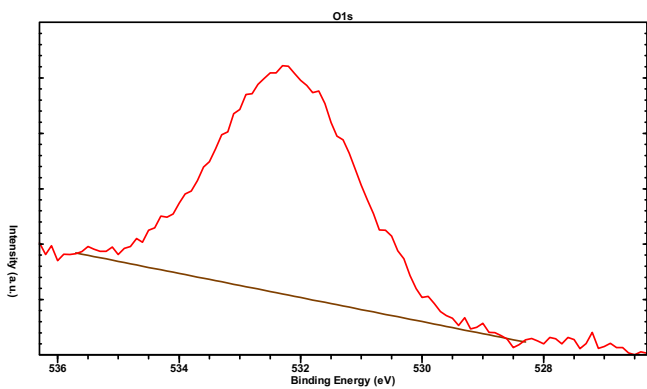
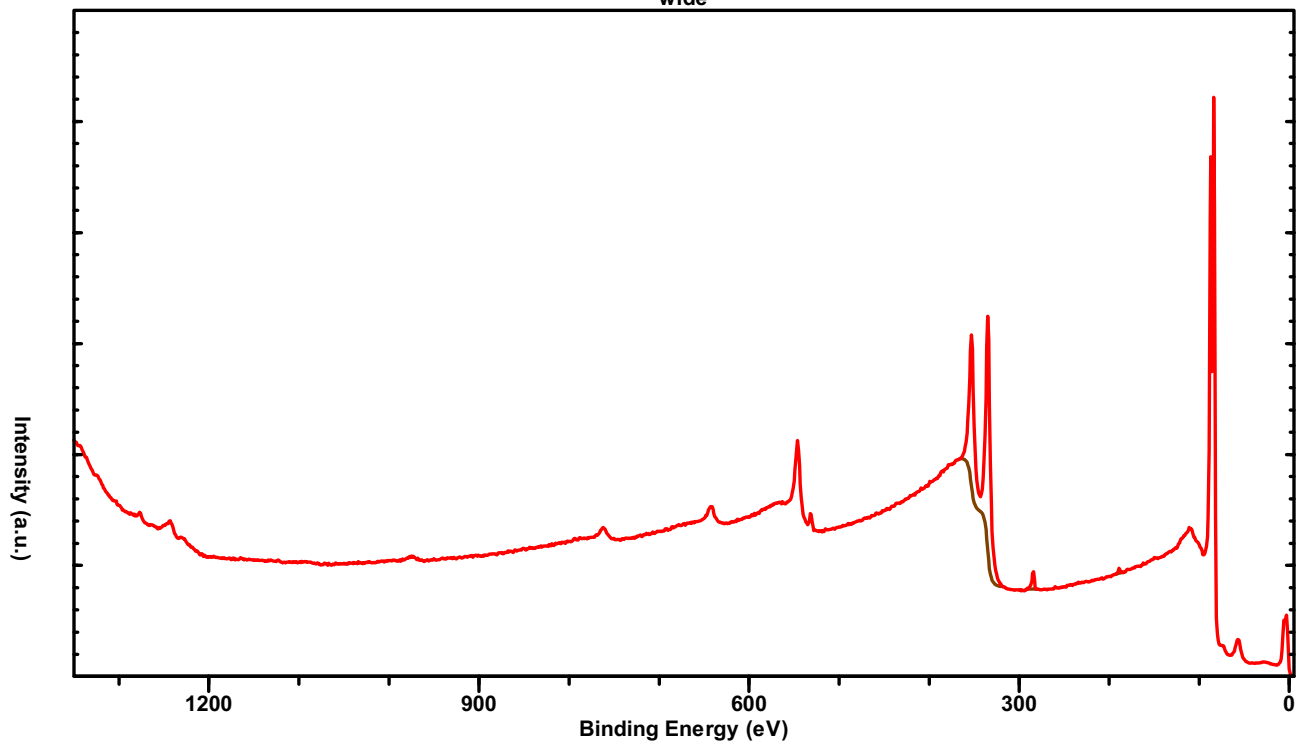
SAM of M9-COOH + Sm(III)

wide



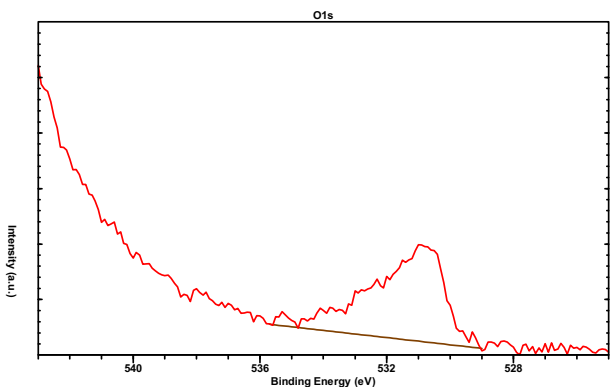
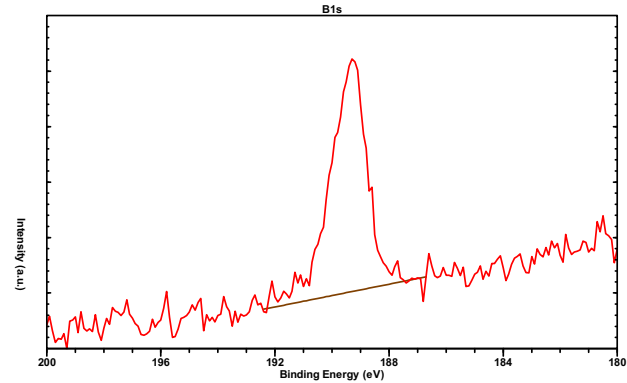
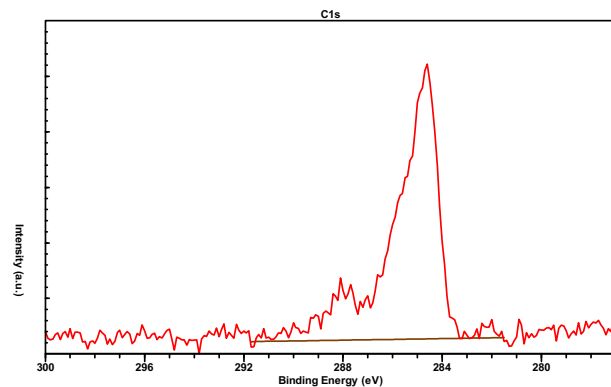
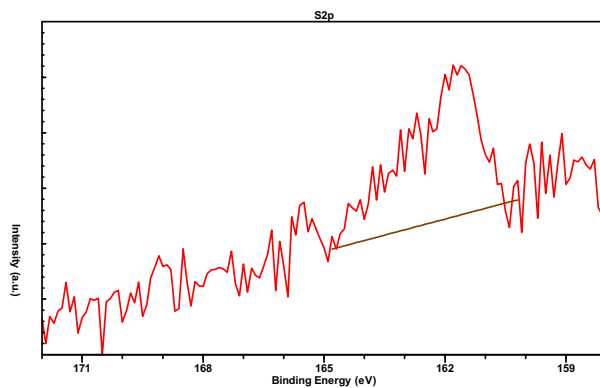
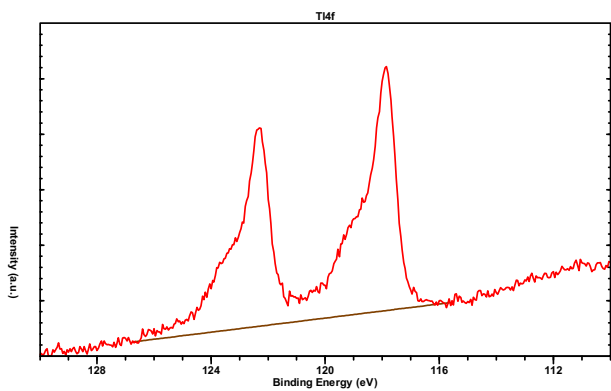
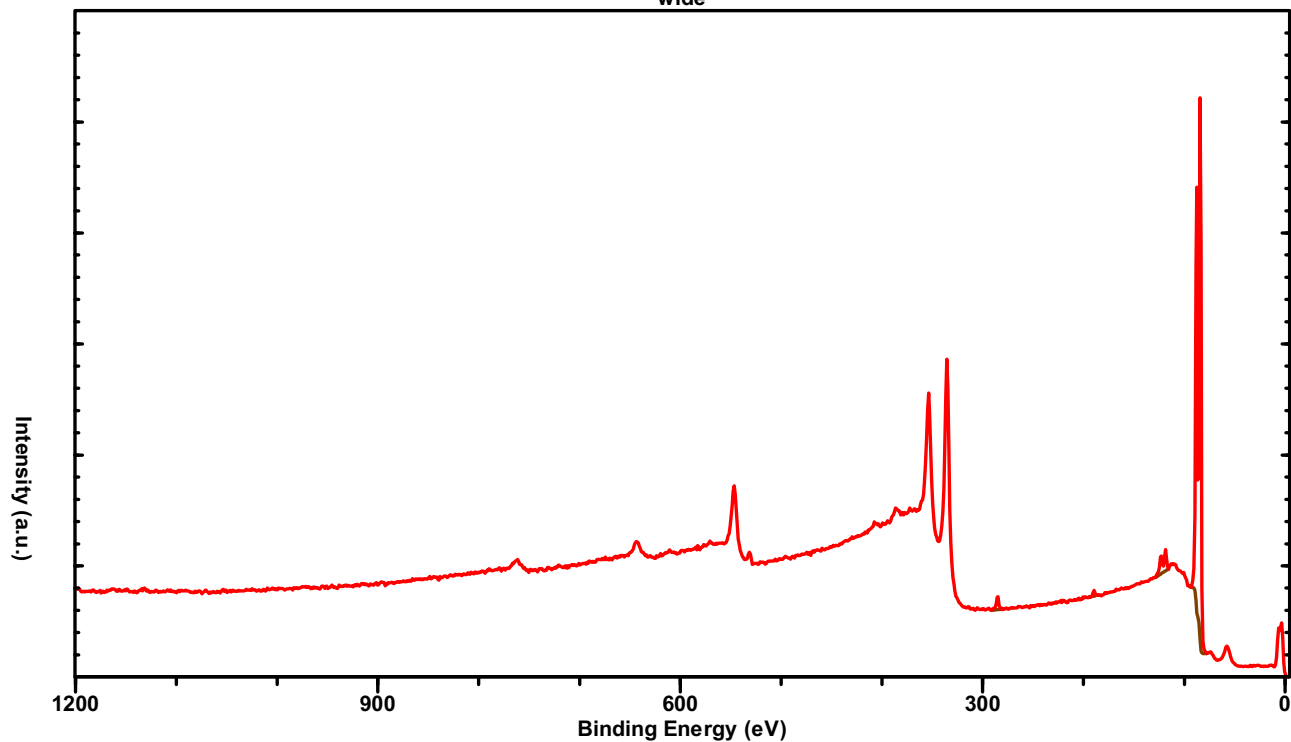
SAM of M9-COOH + Tb(III)

wide



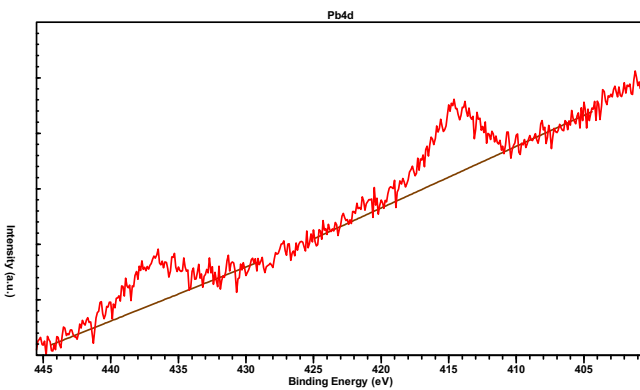
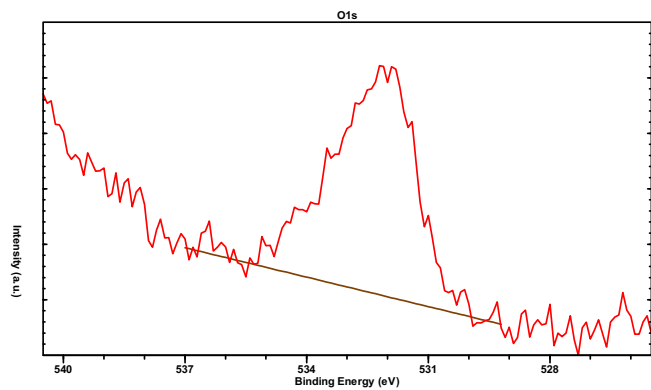
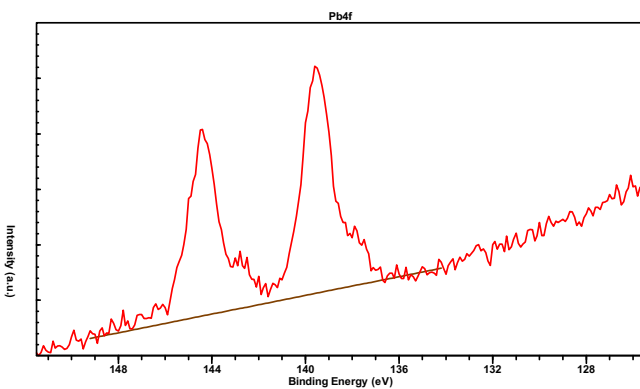
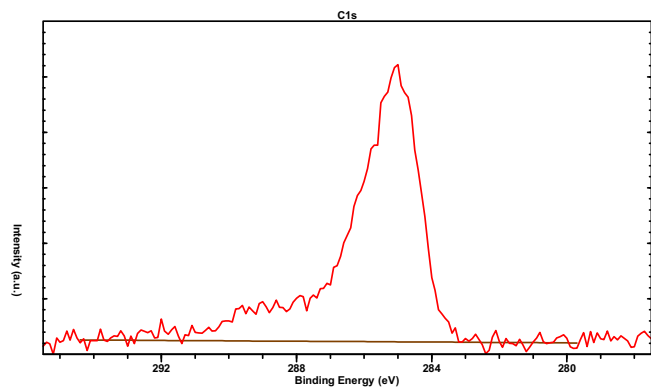
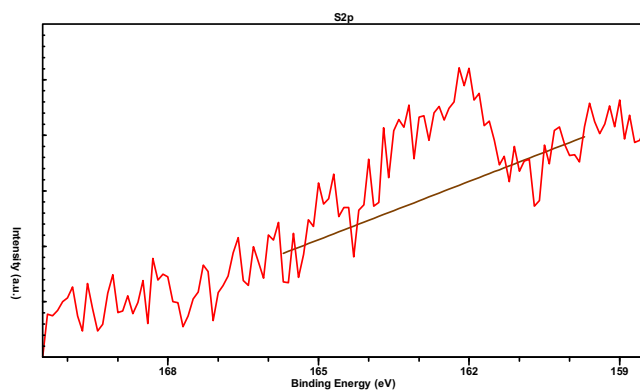
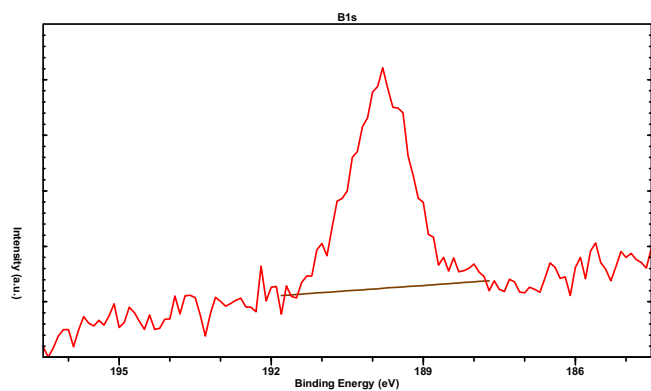
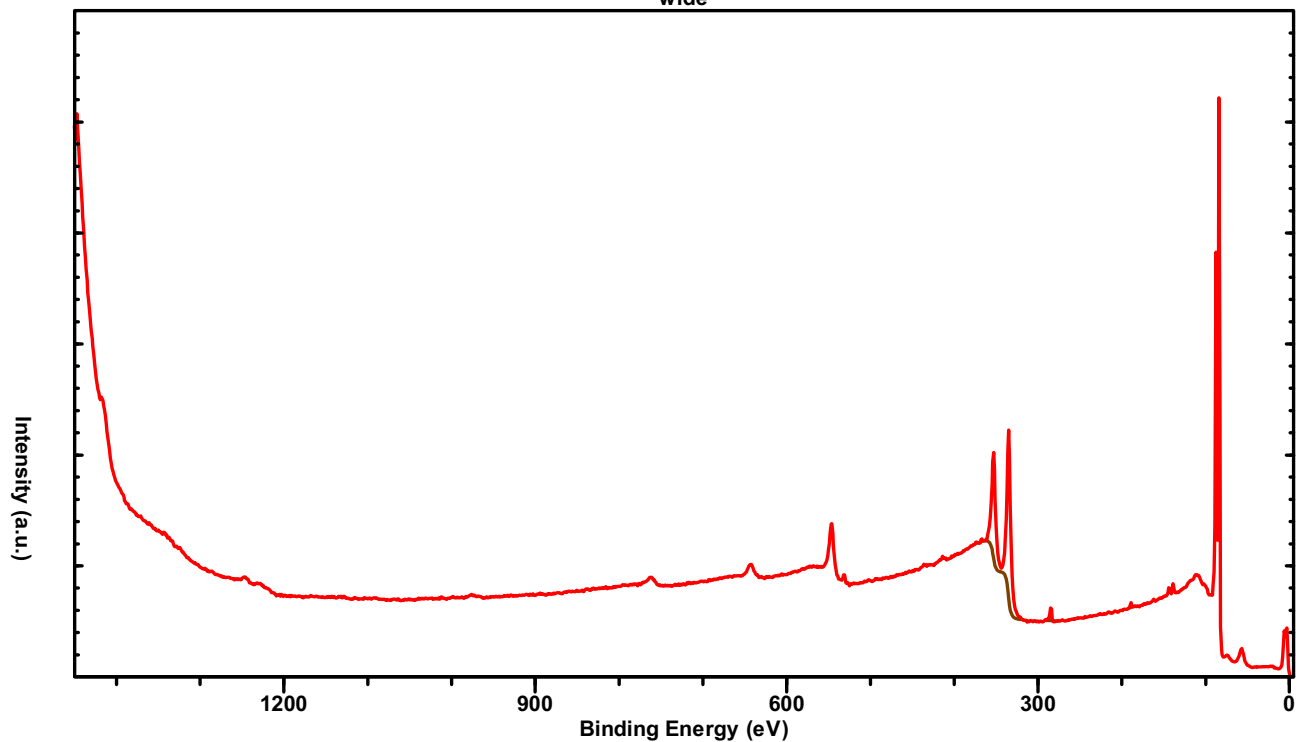
SAM of M9-COOH + TI(I)

wide

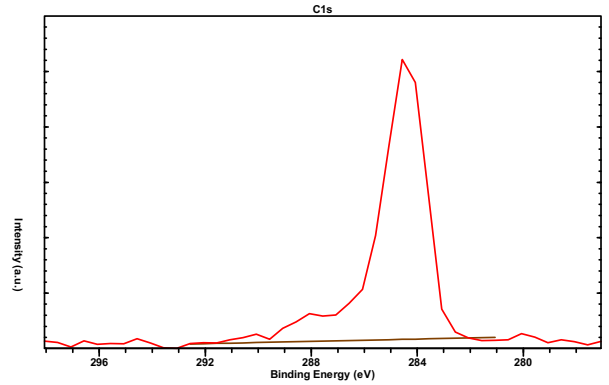
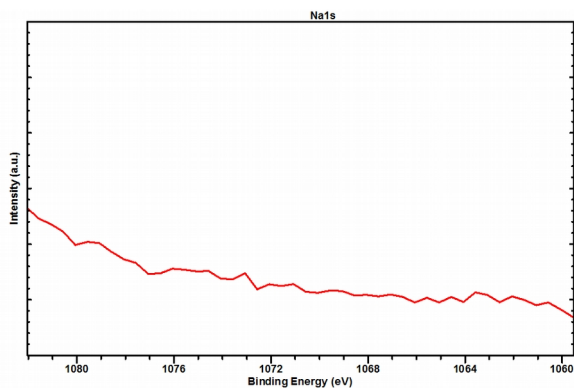
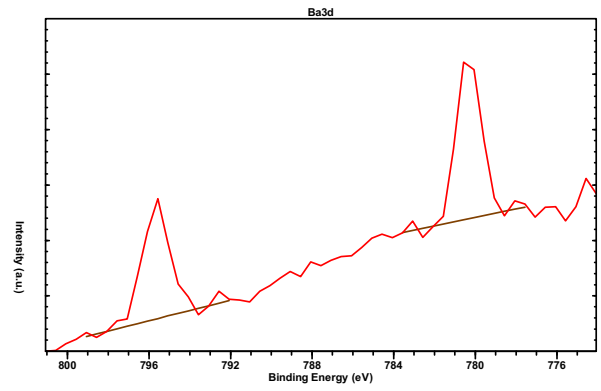
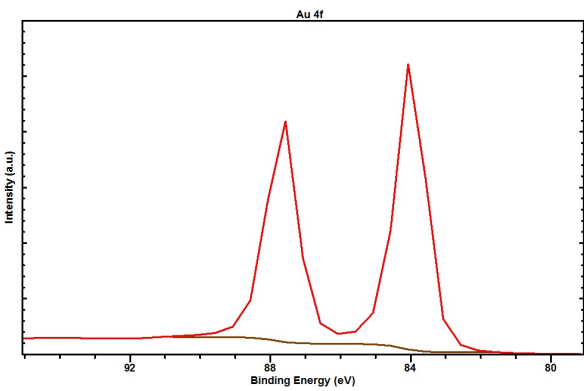
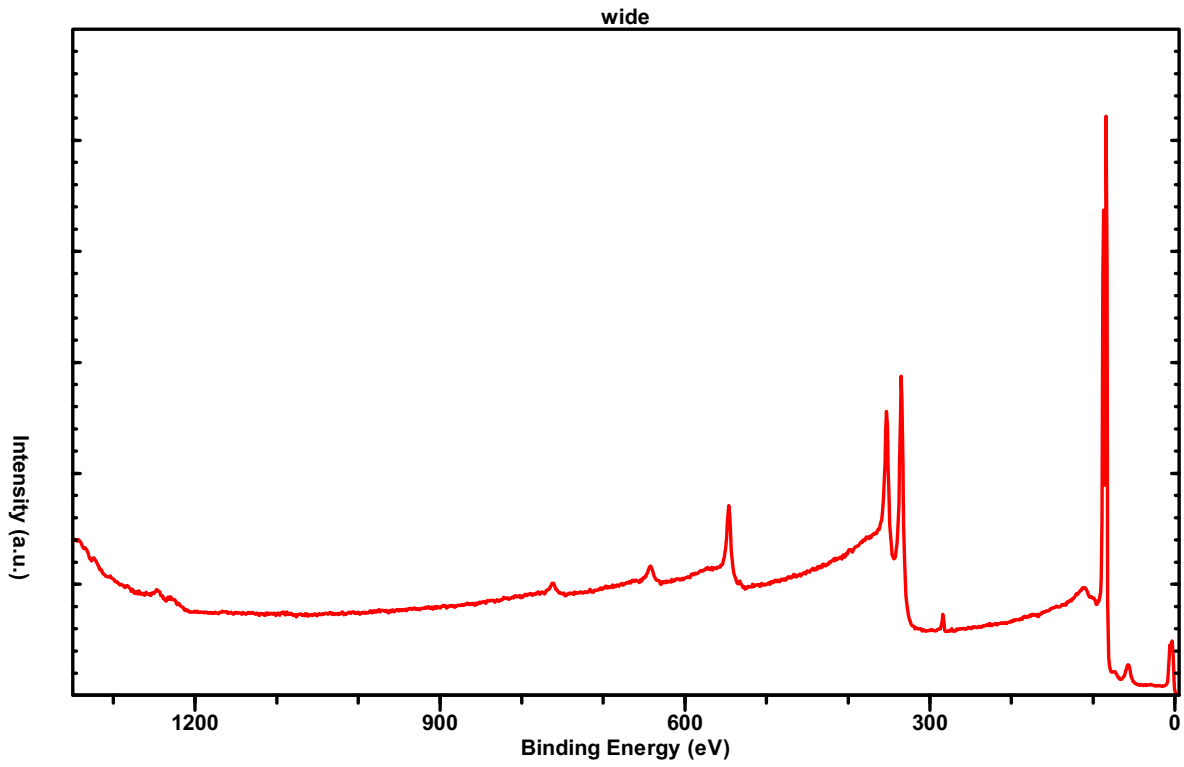


SAM of M9-COOH + Pb(II)

wide

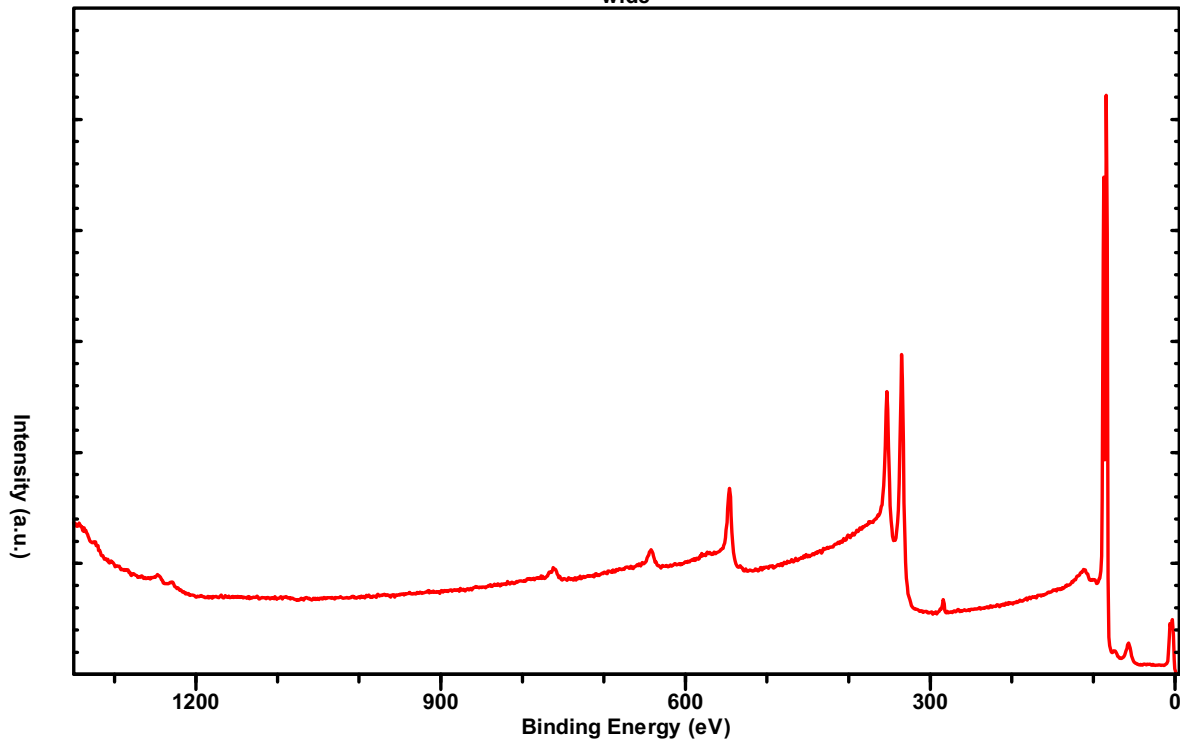


Au substrate after immersion into aq. solution of BaCl_2 for 1 hour

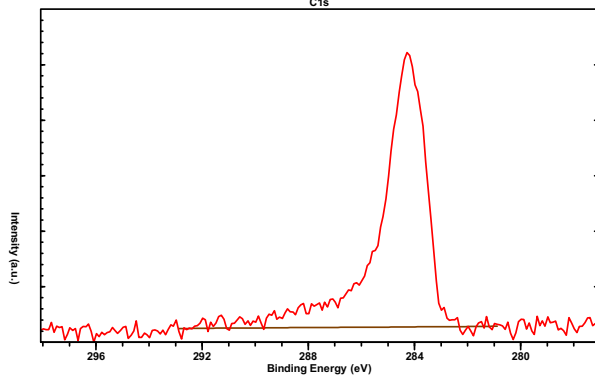


Au substrate after immersion into 96% ethanol for 1 hour

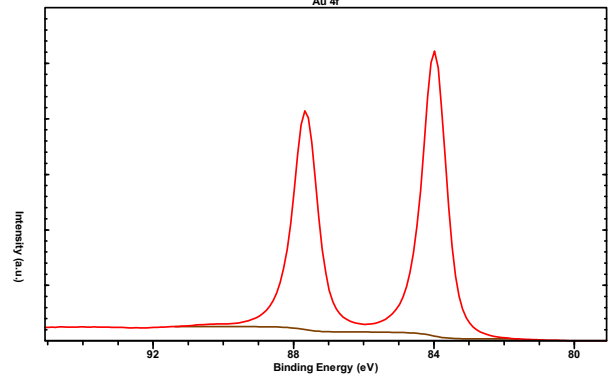
wide



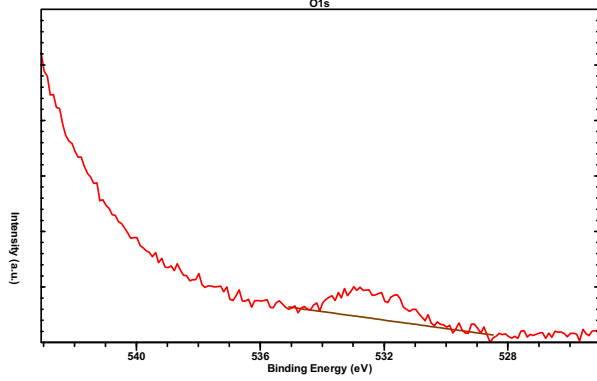
C1s



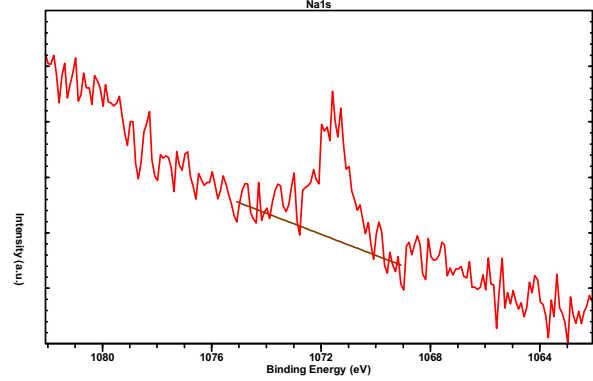
Au 4f



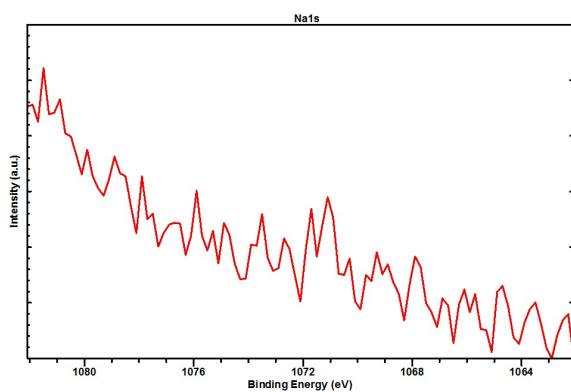
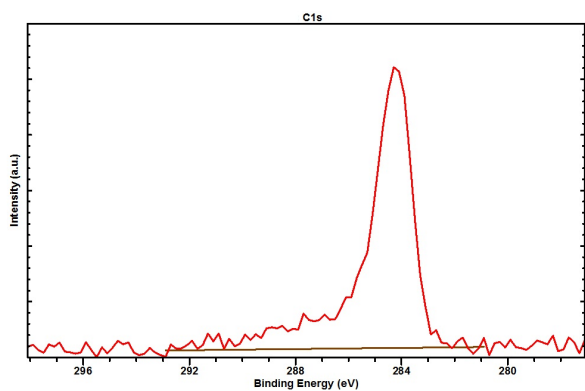
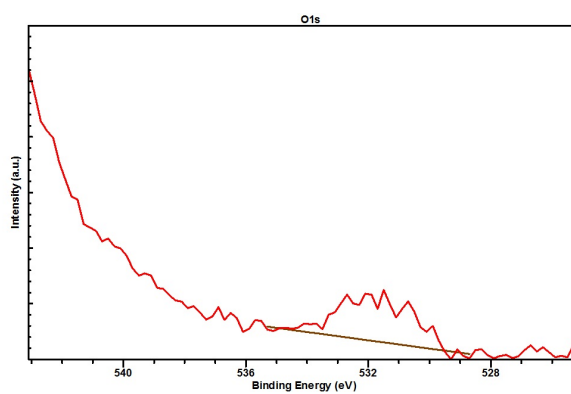
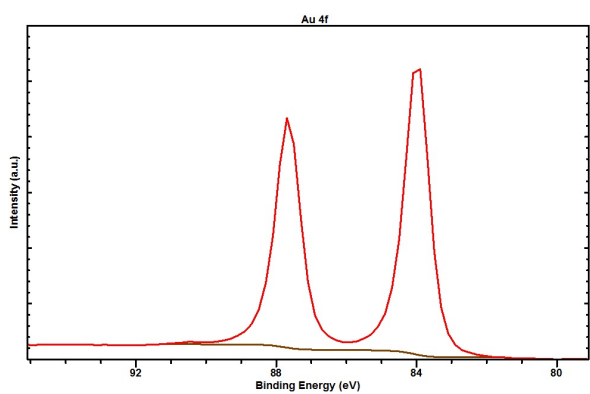
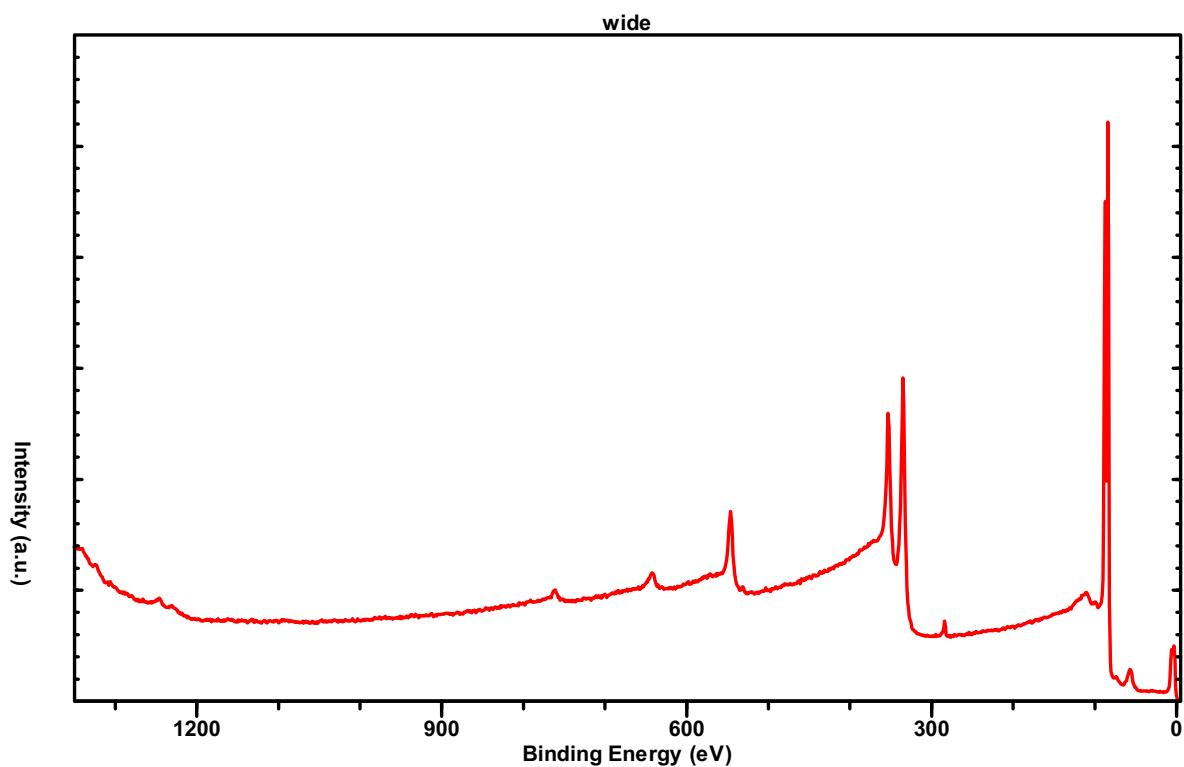
O1s

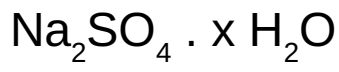


Na1s

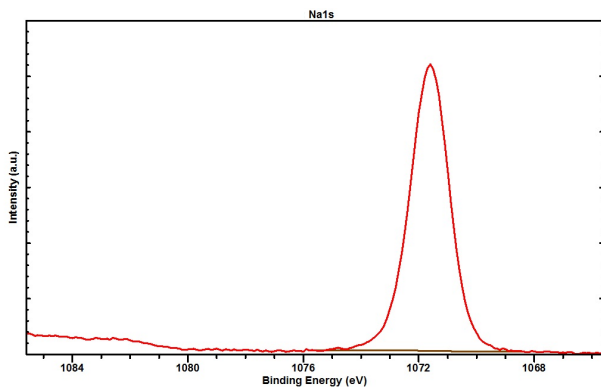
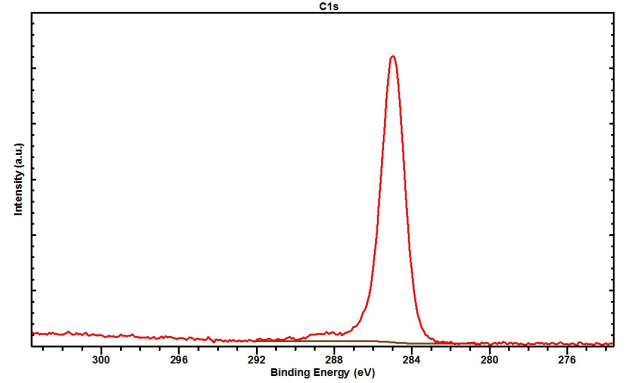
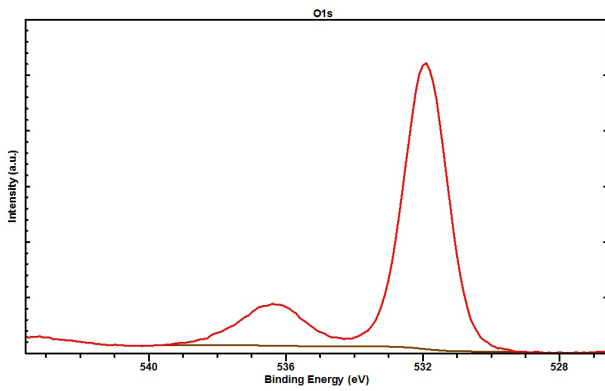
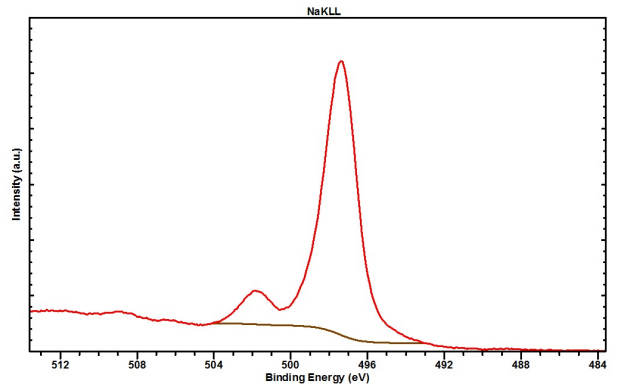
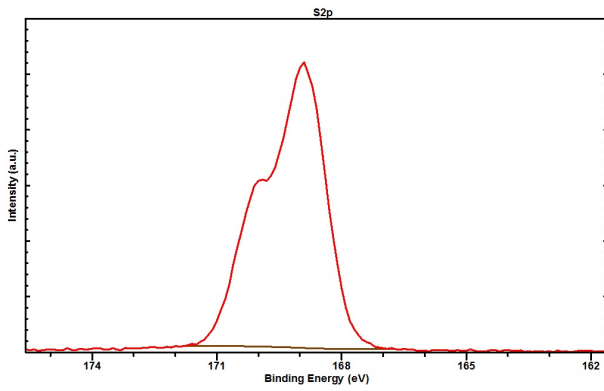
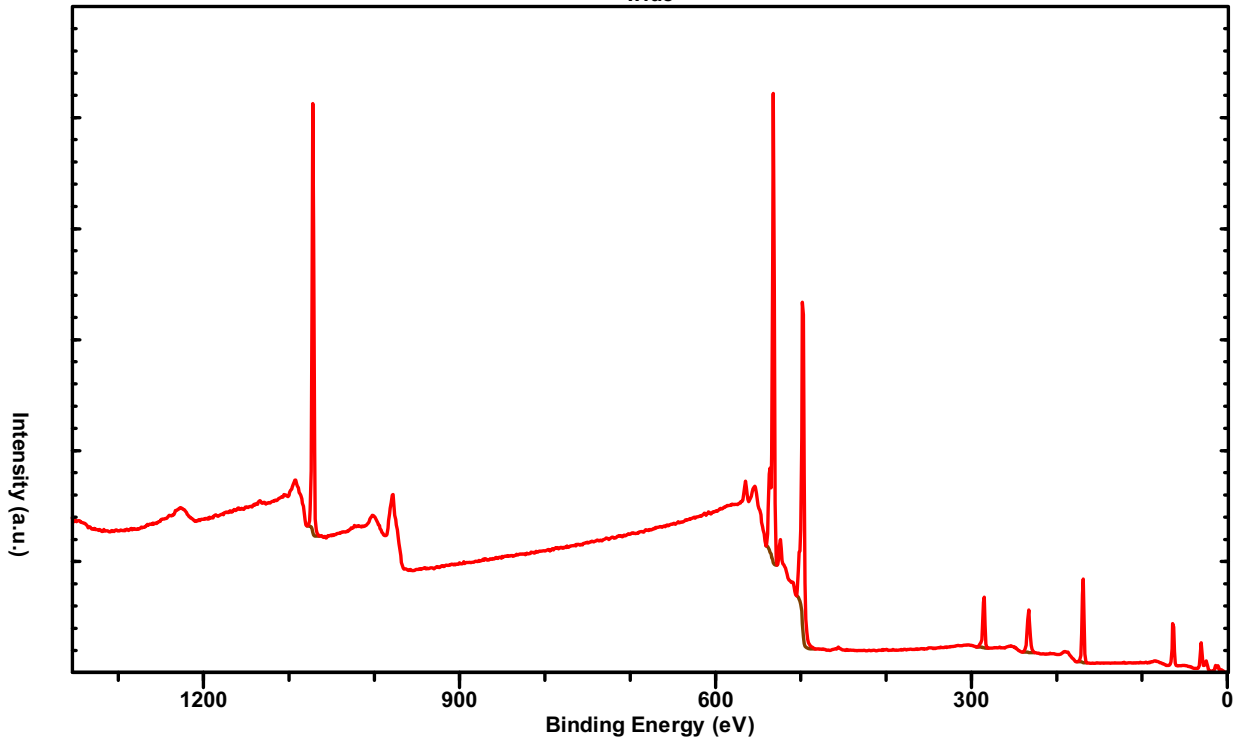


Au substrate after immersion into aq. solution of NaCl for 1 hour

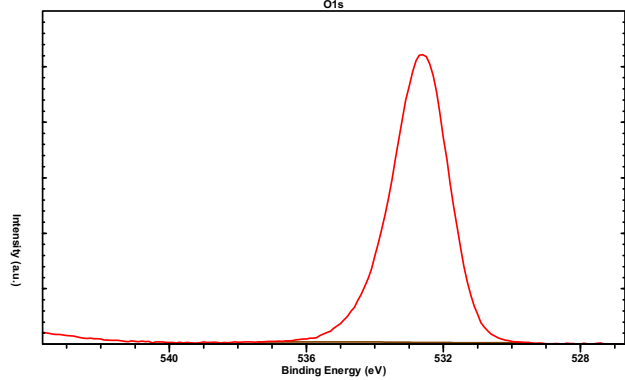
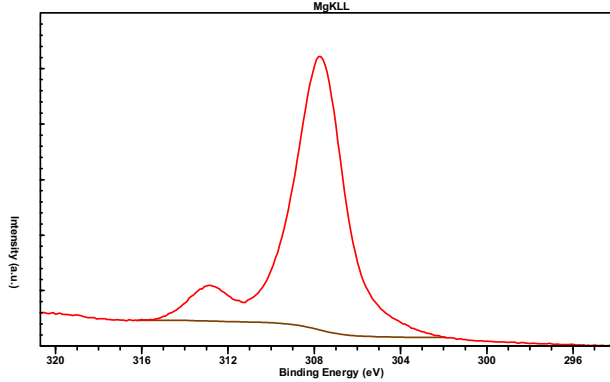
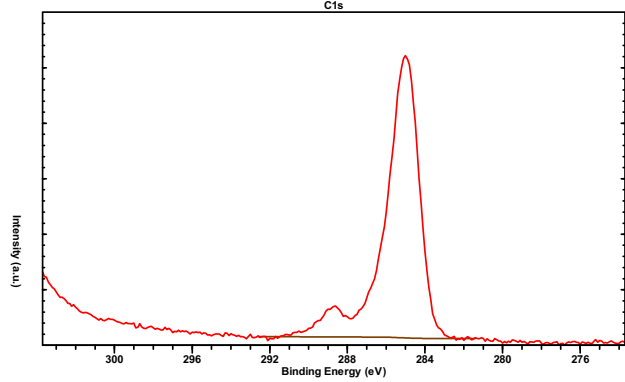
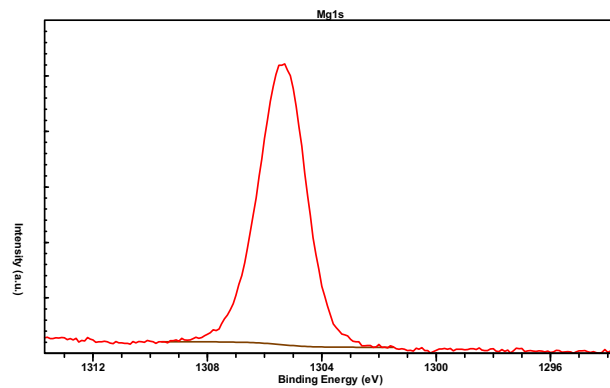
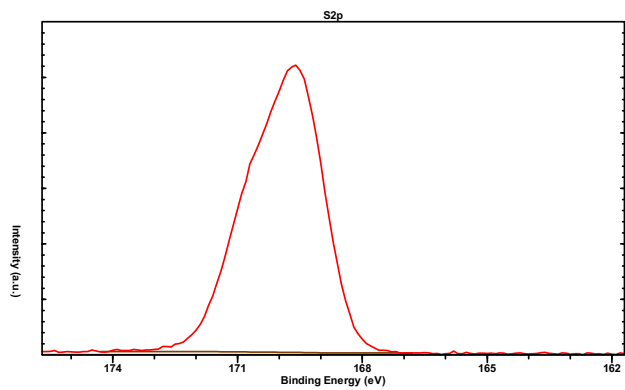
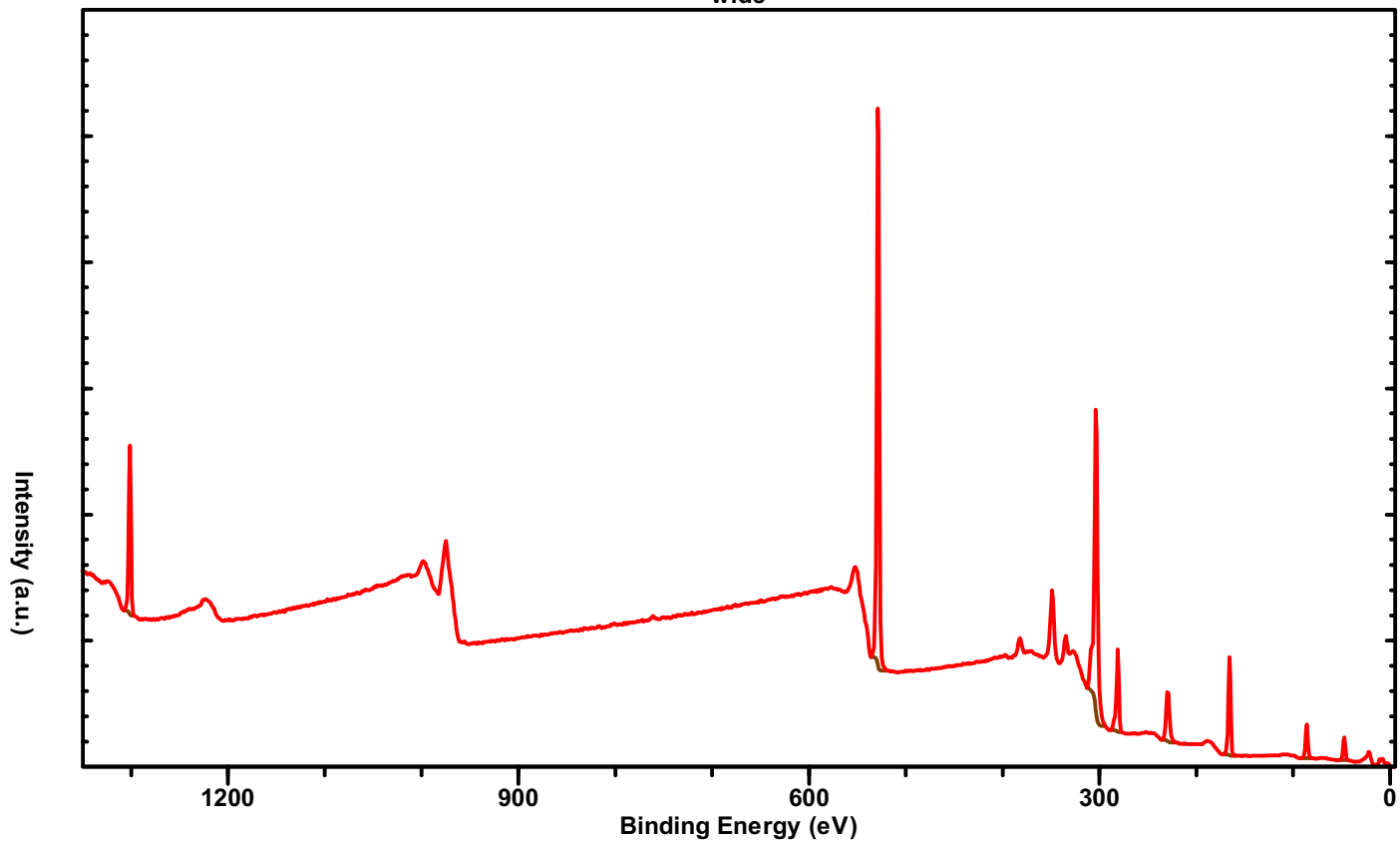




wide

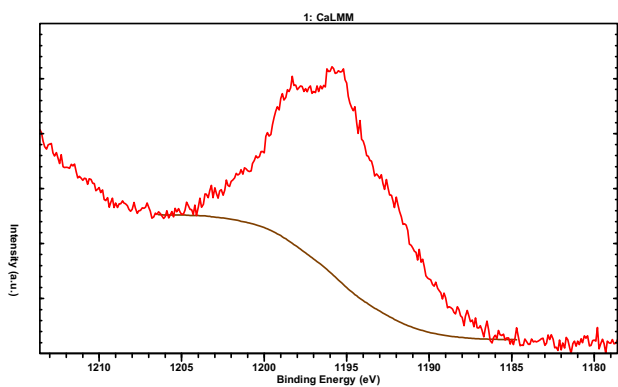
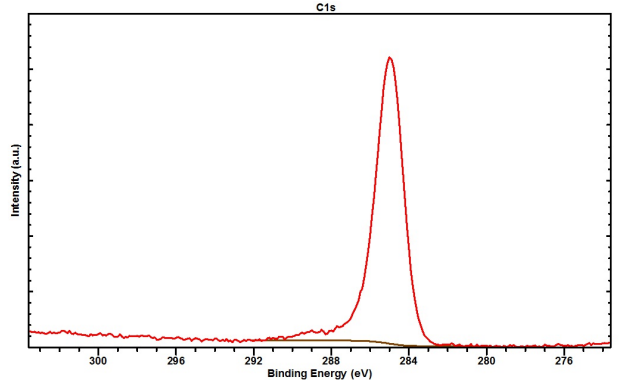
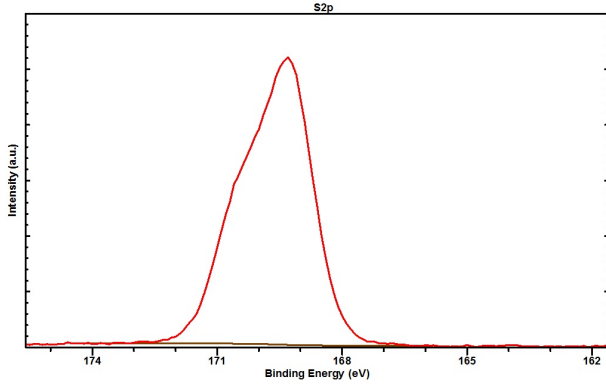
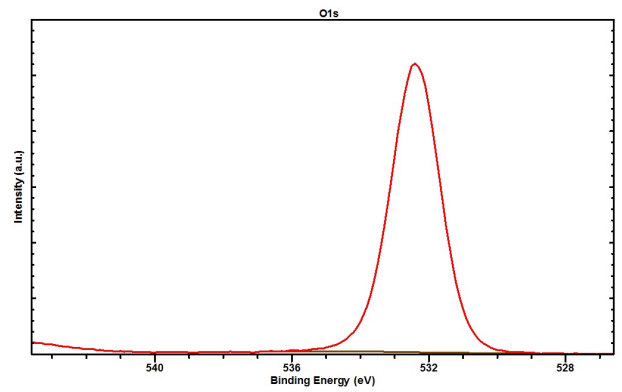
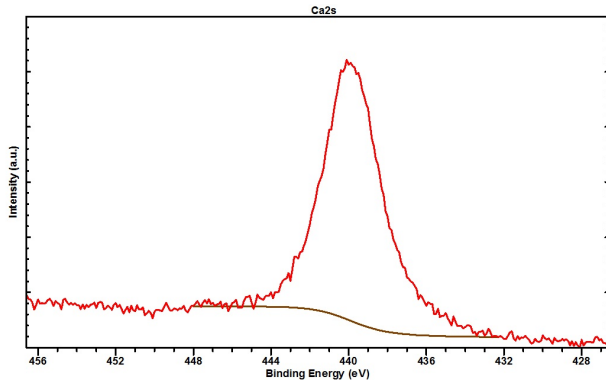
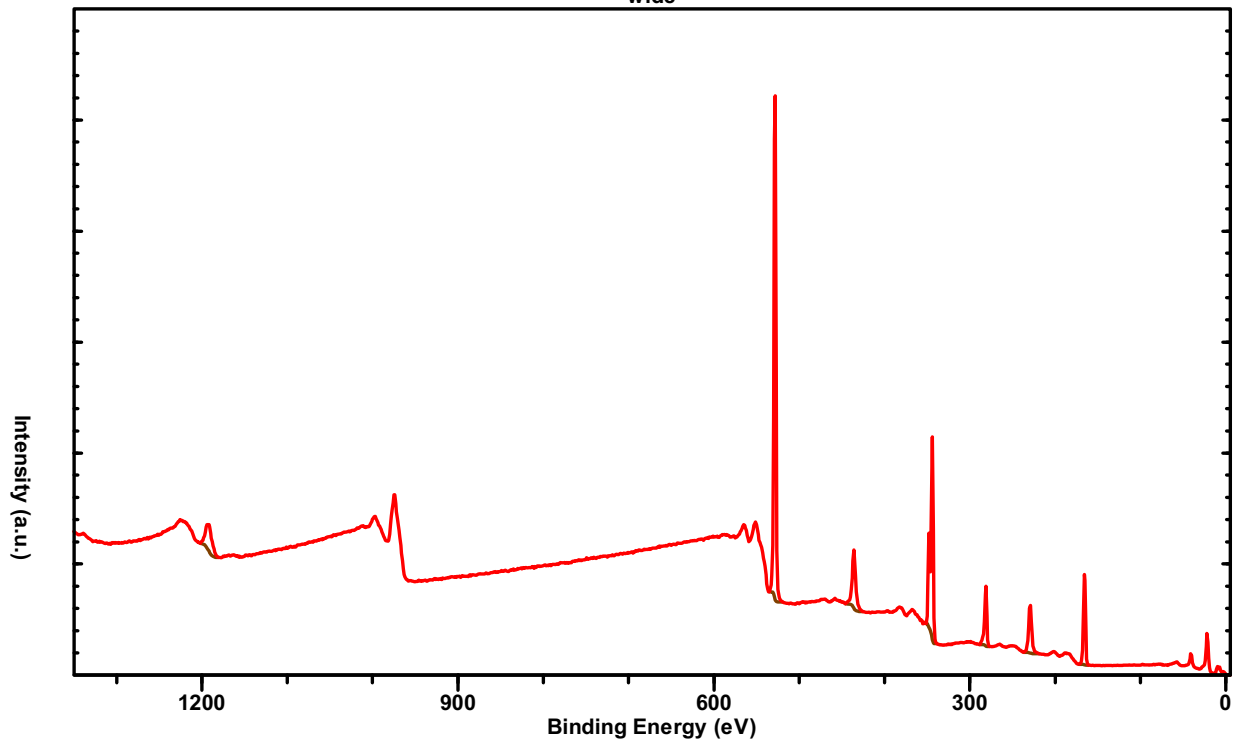


anhy. MgSO₄
wide



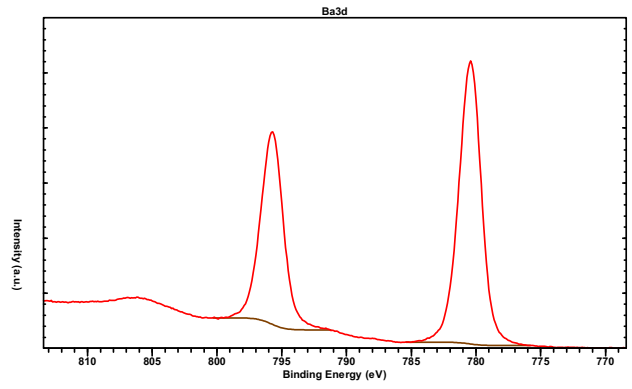
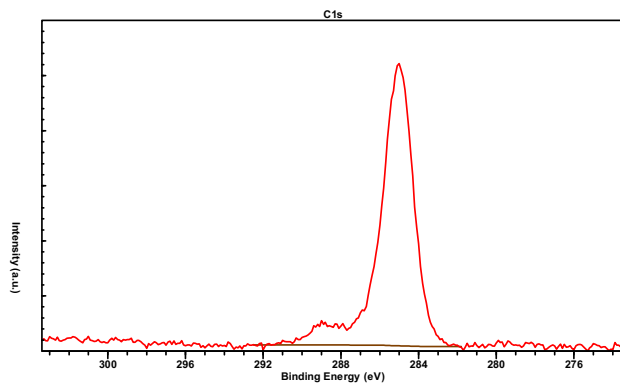
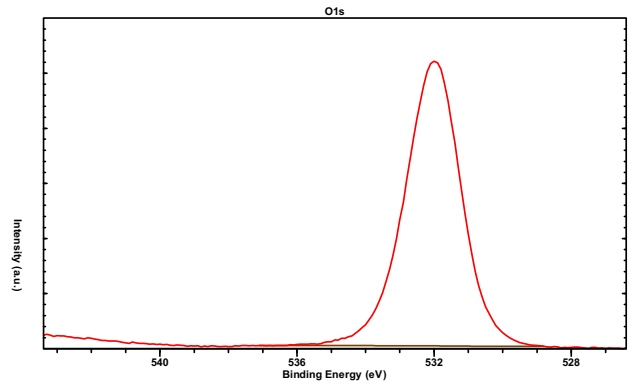
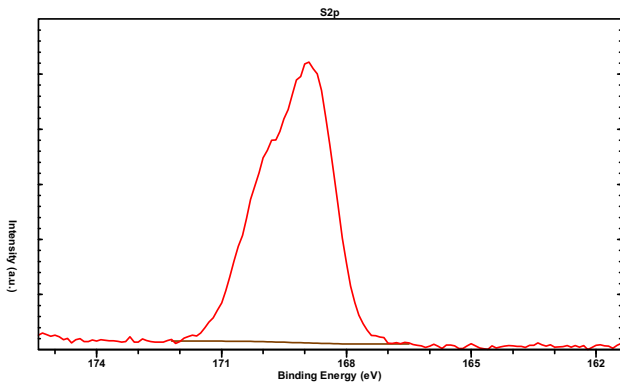
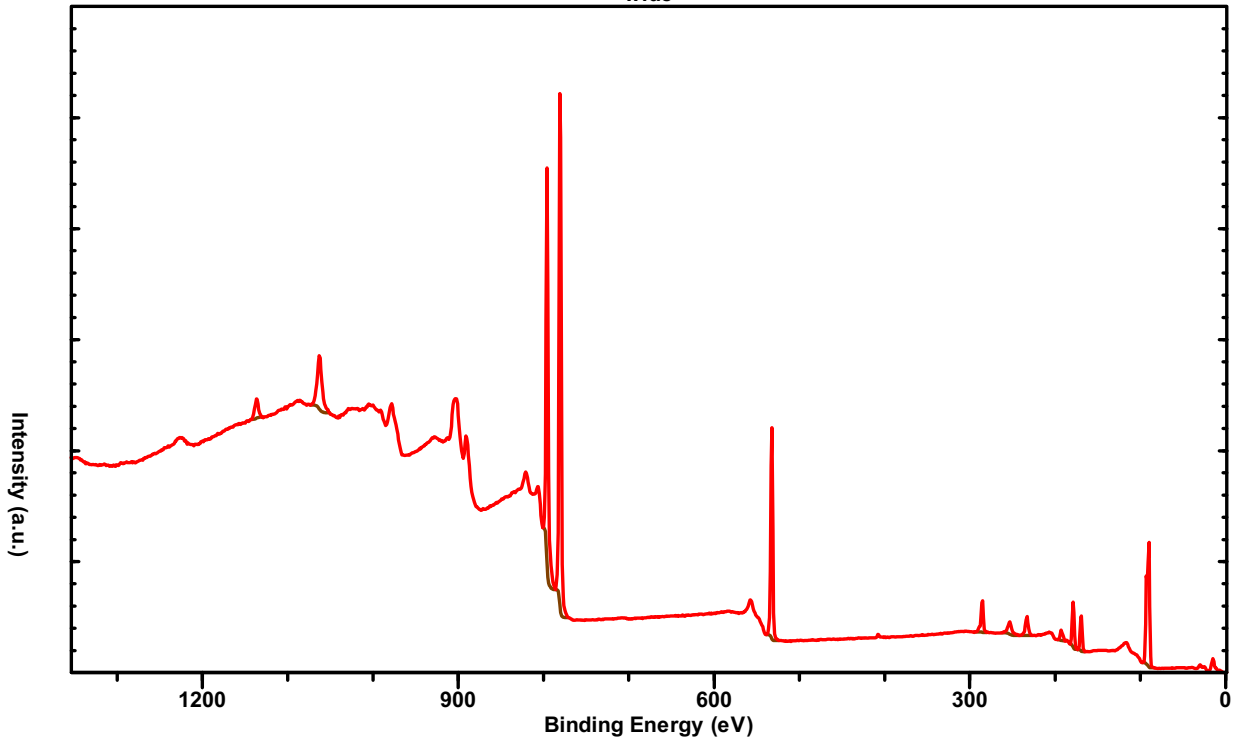
CaSO4

wide



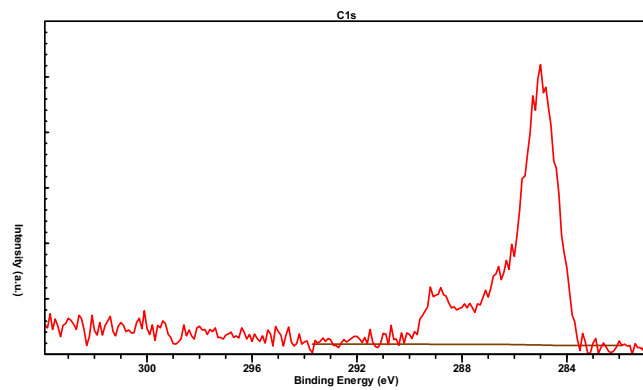
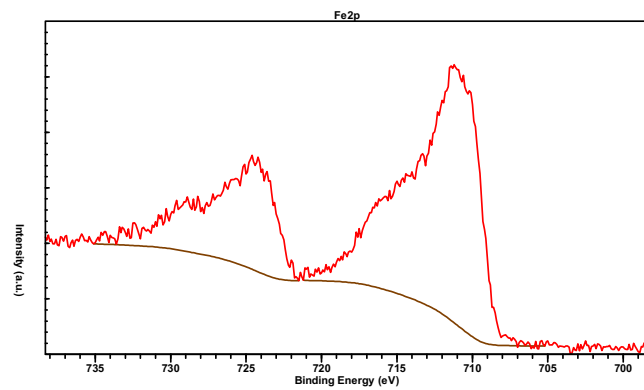
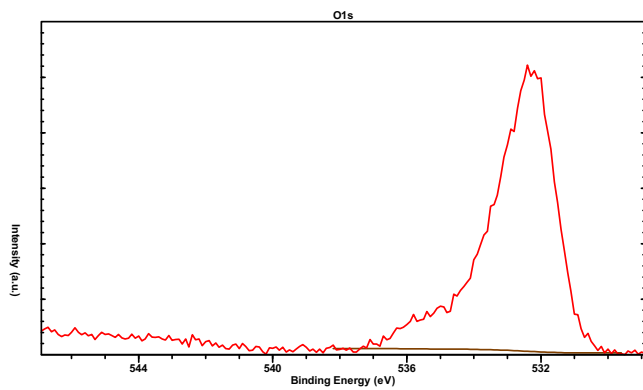
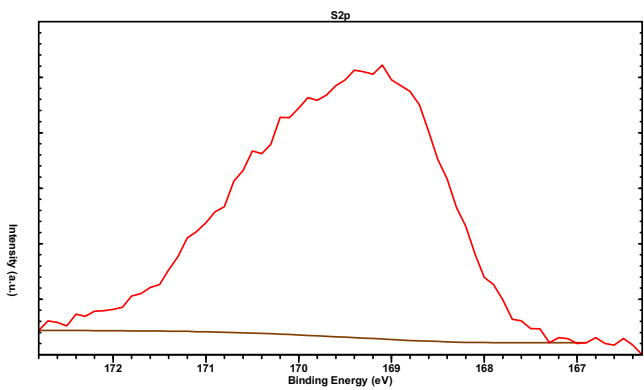
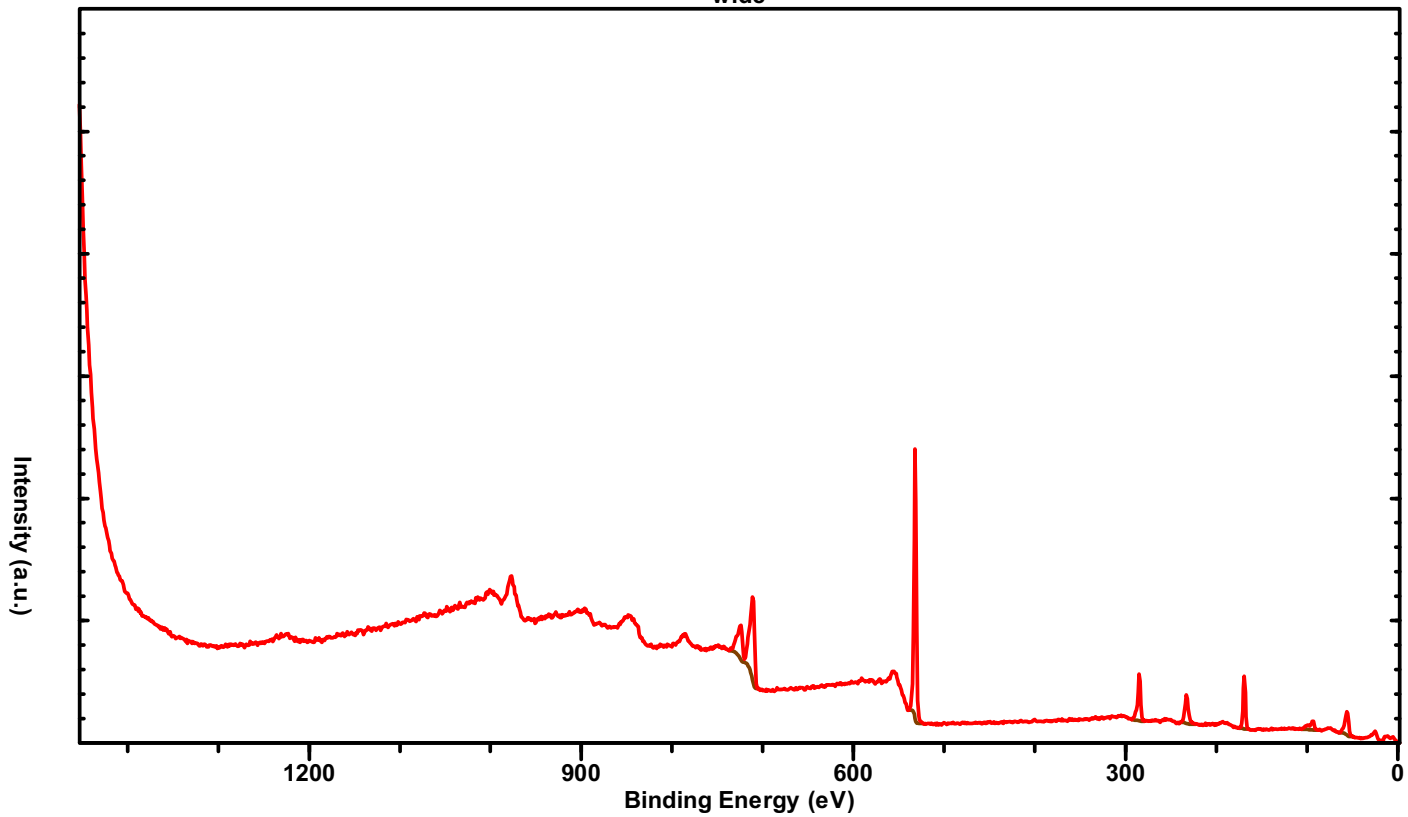
BaSO₄

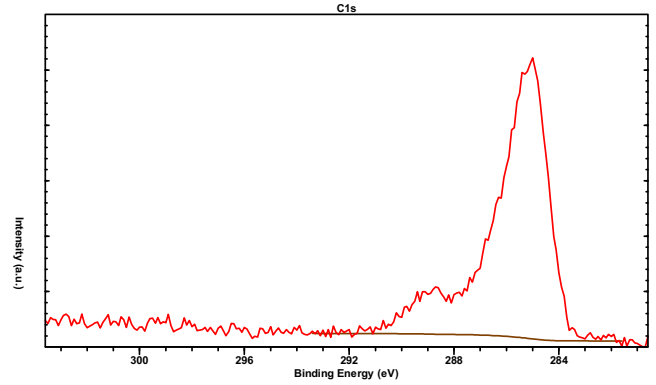
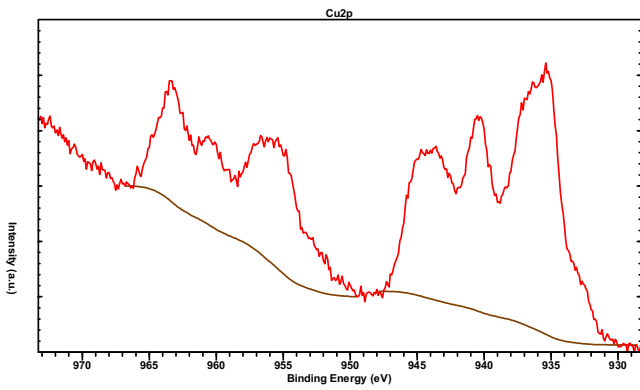
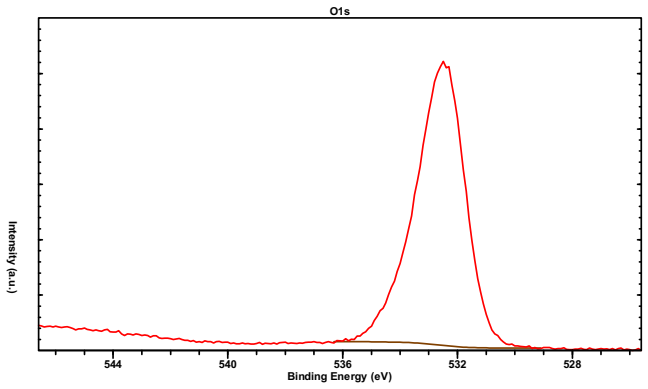
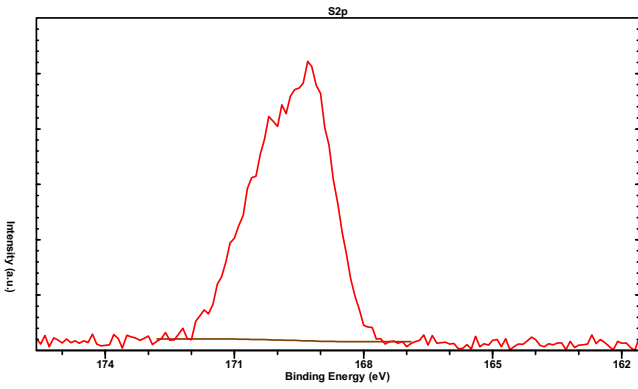
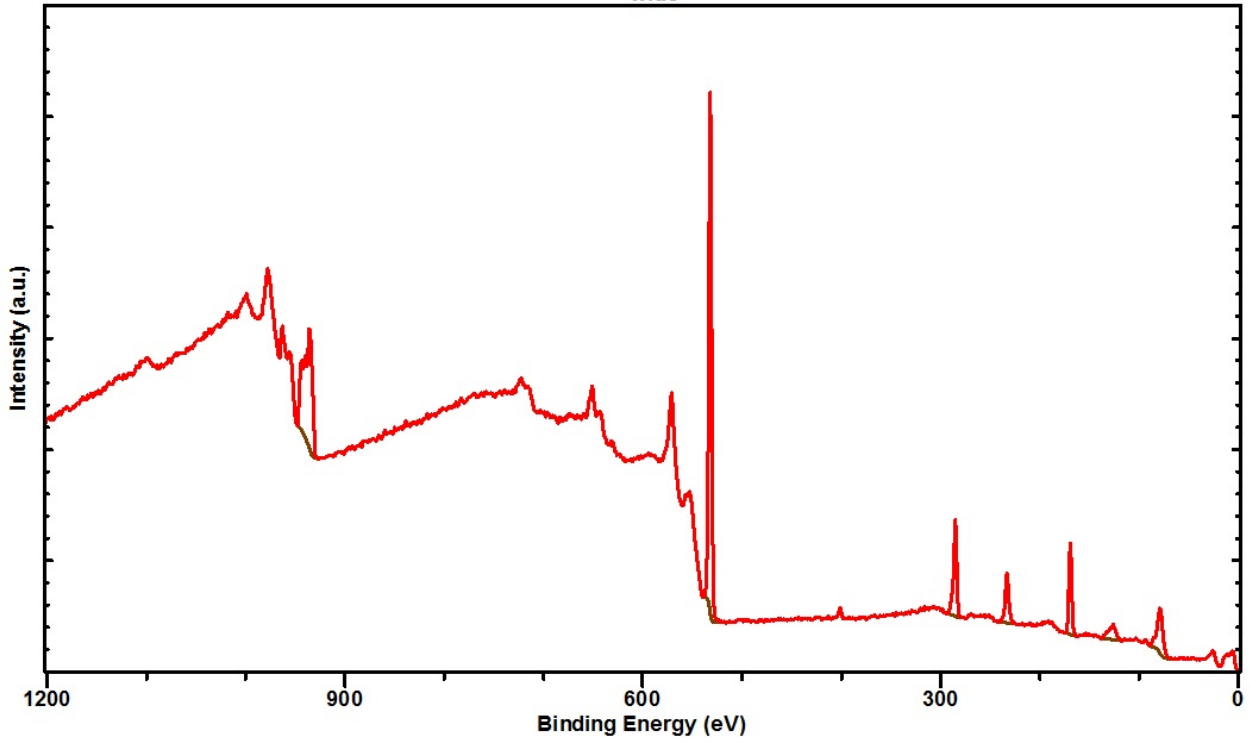
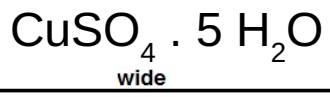
wide

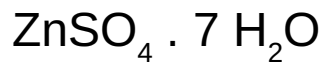


FeSO₄ · 7 H₂O

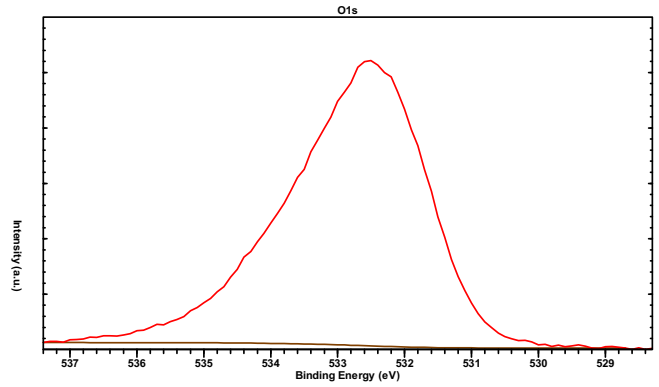
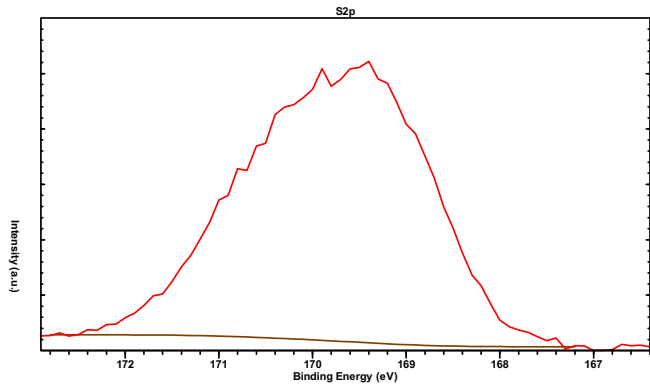
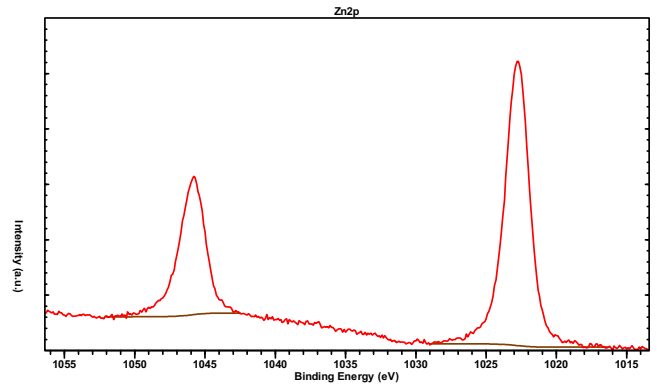
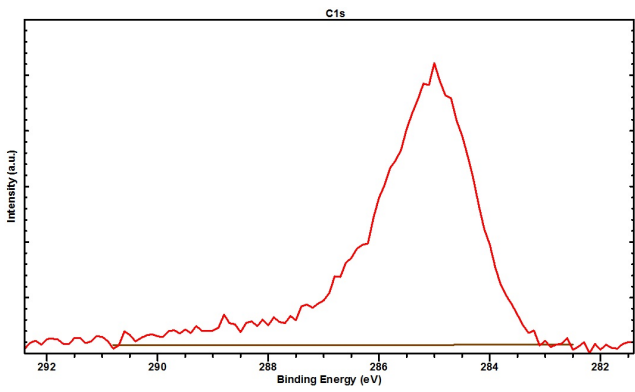
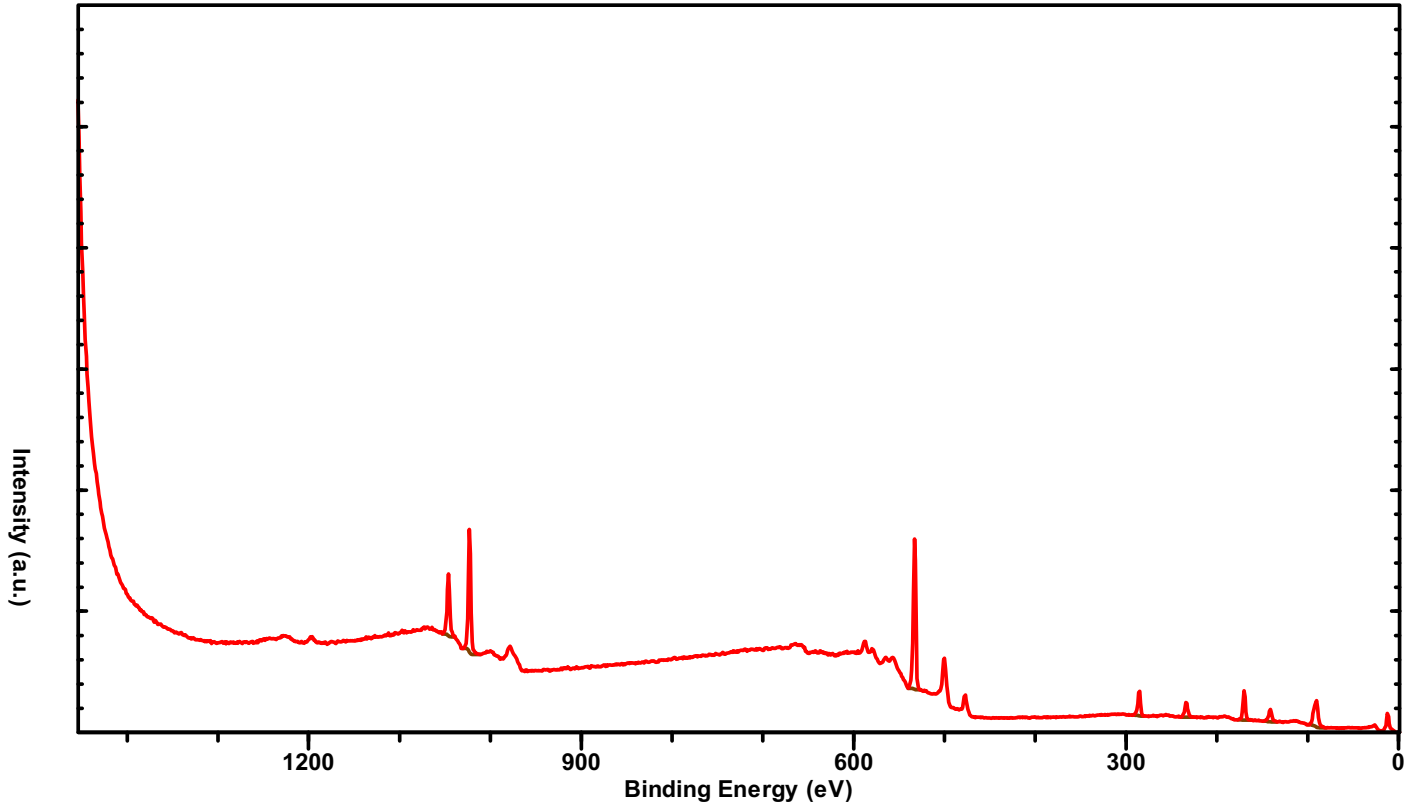
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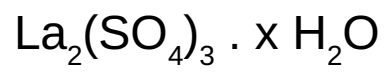




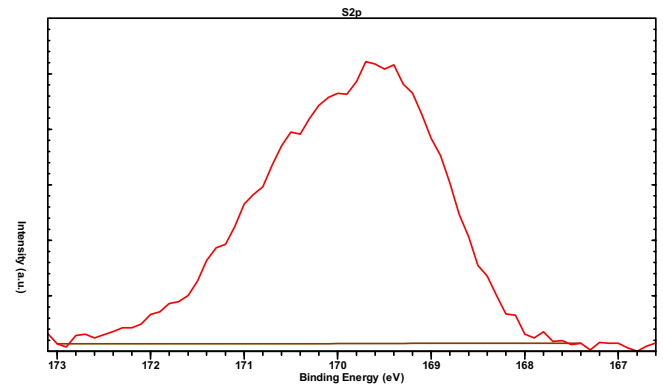
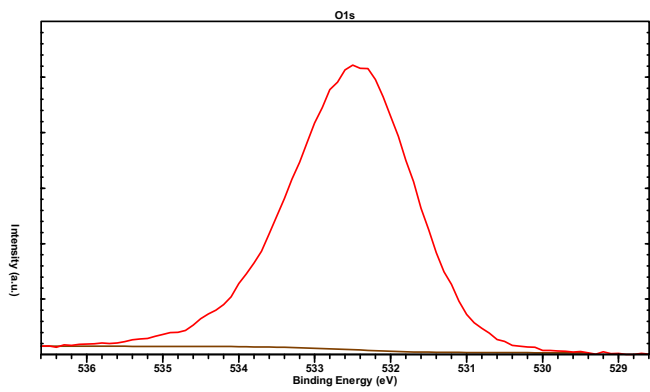
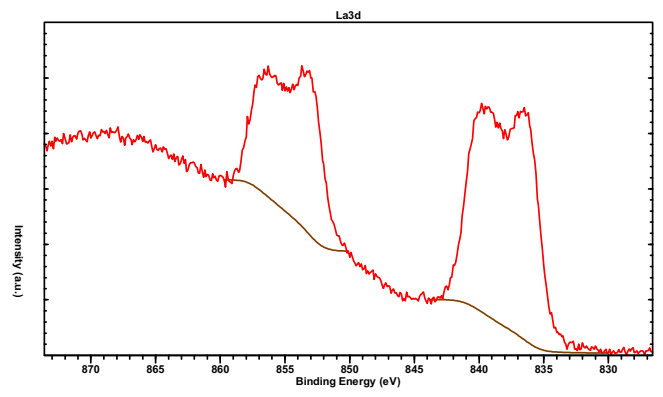
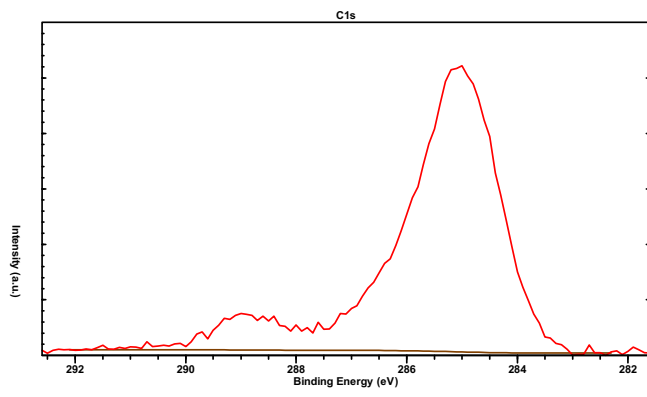
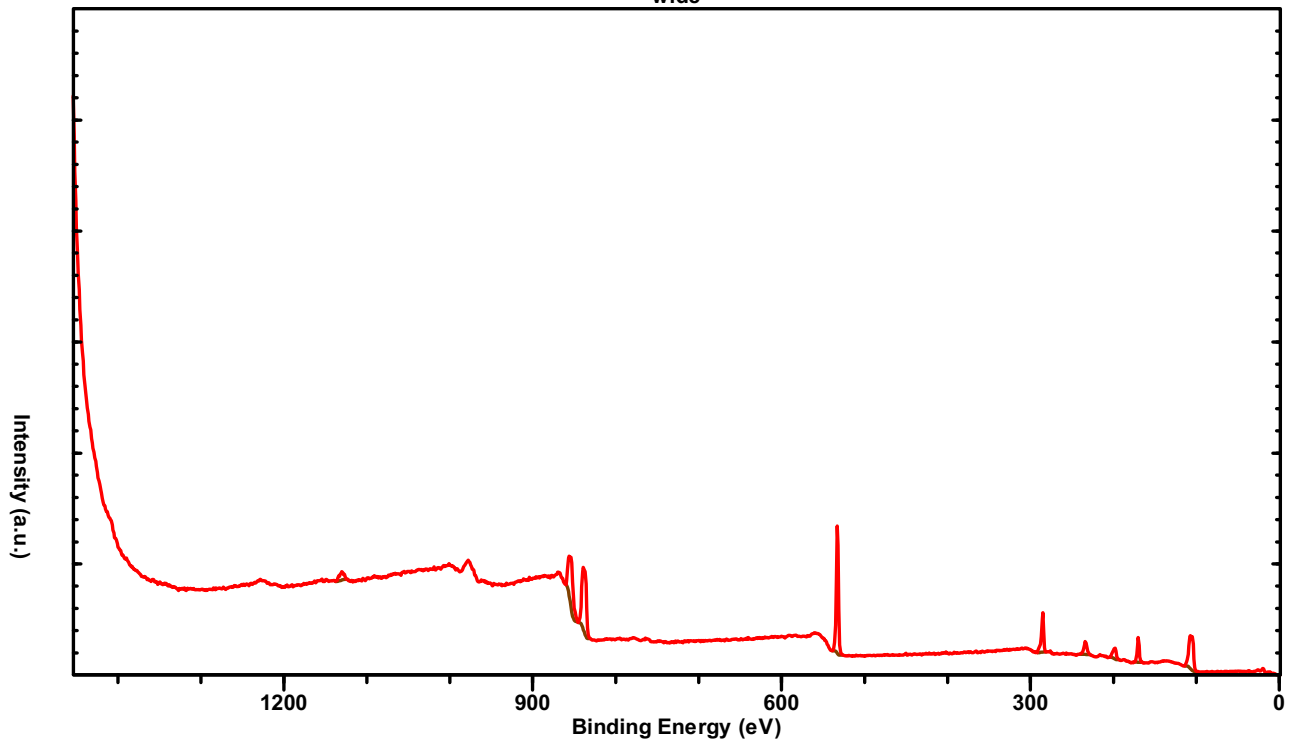


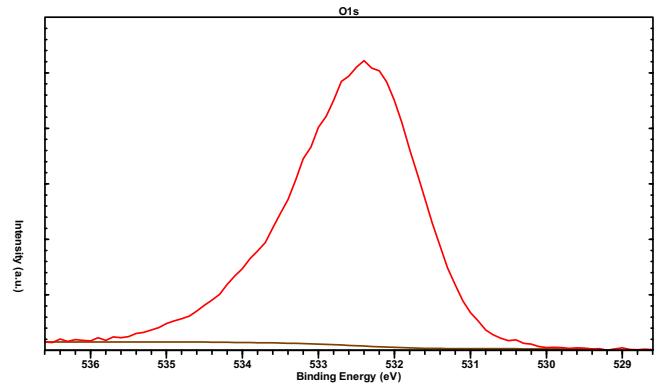
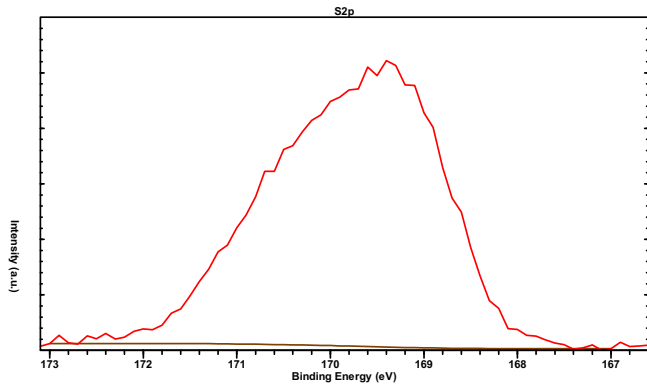
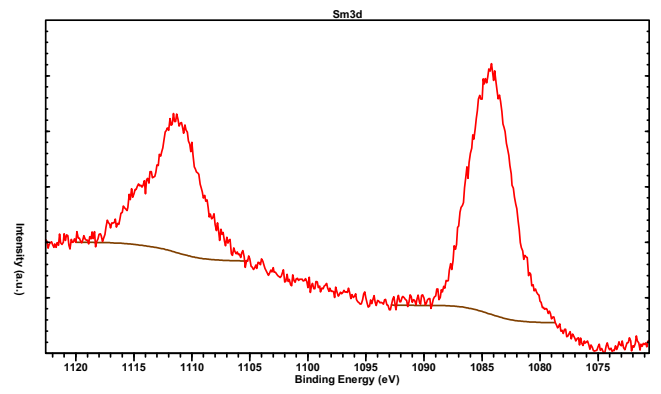
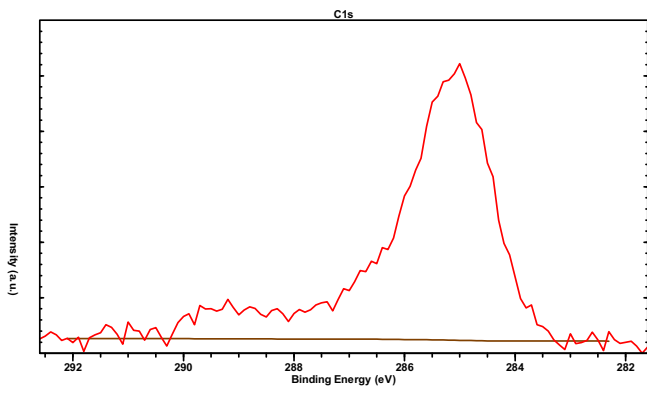
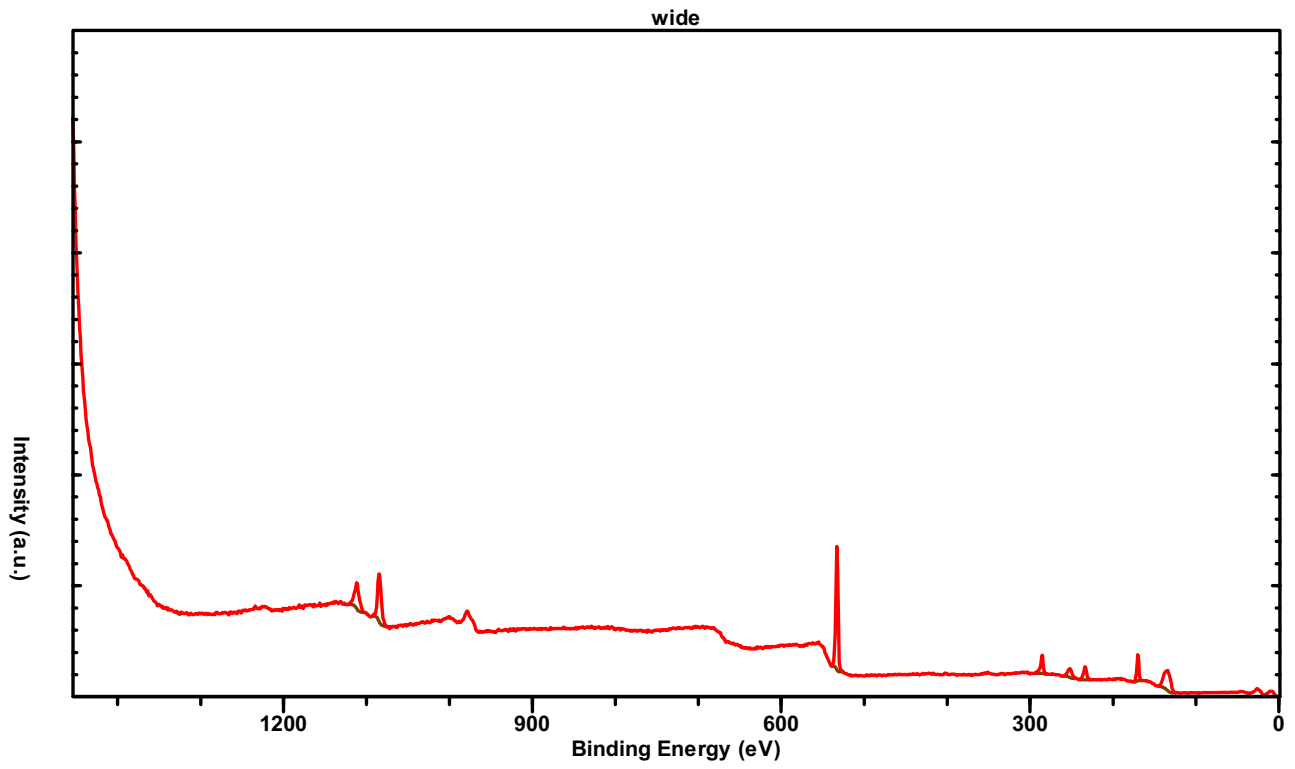
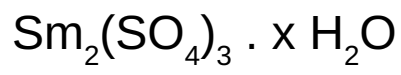
wide

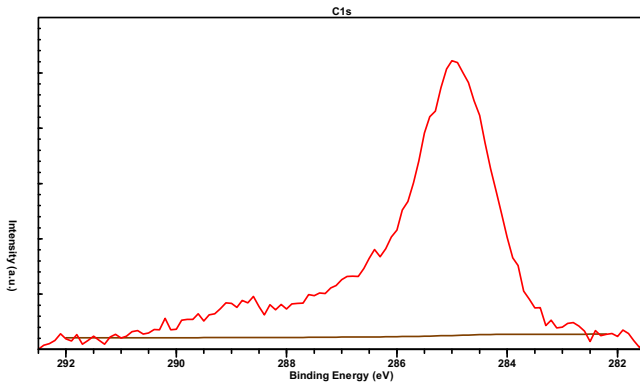
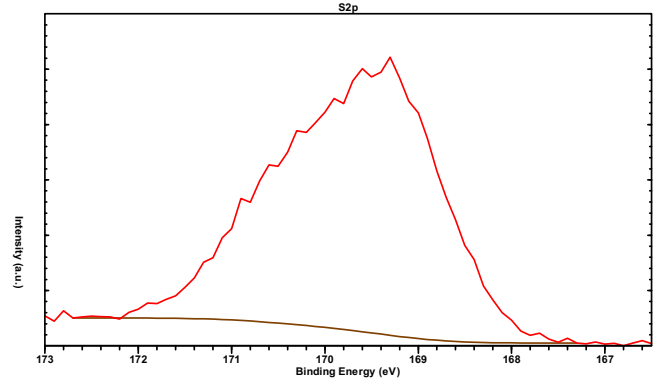
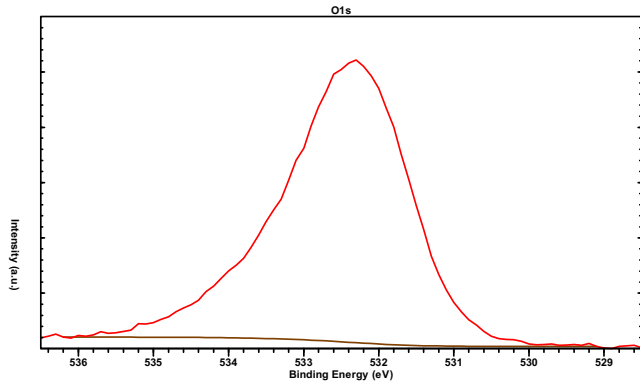
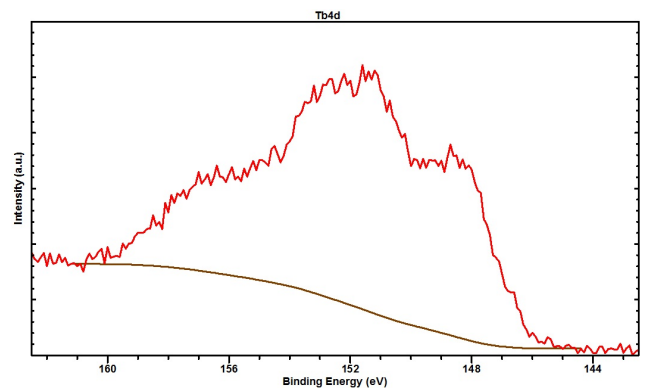
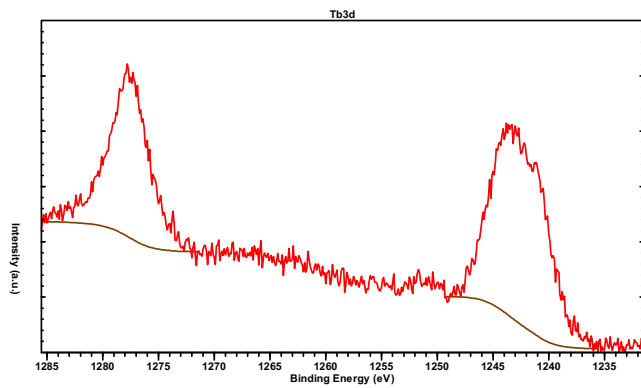
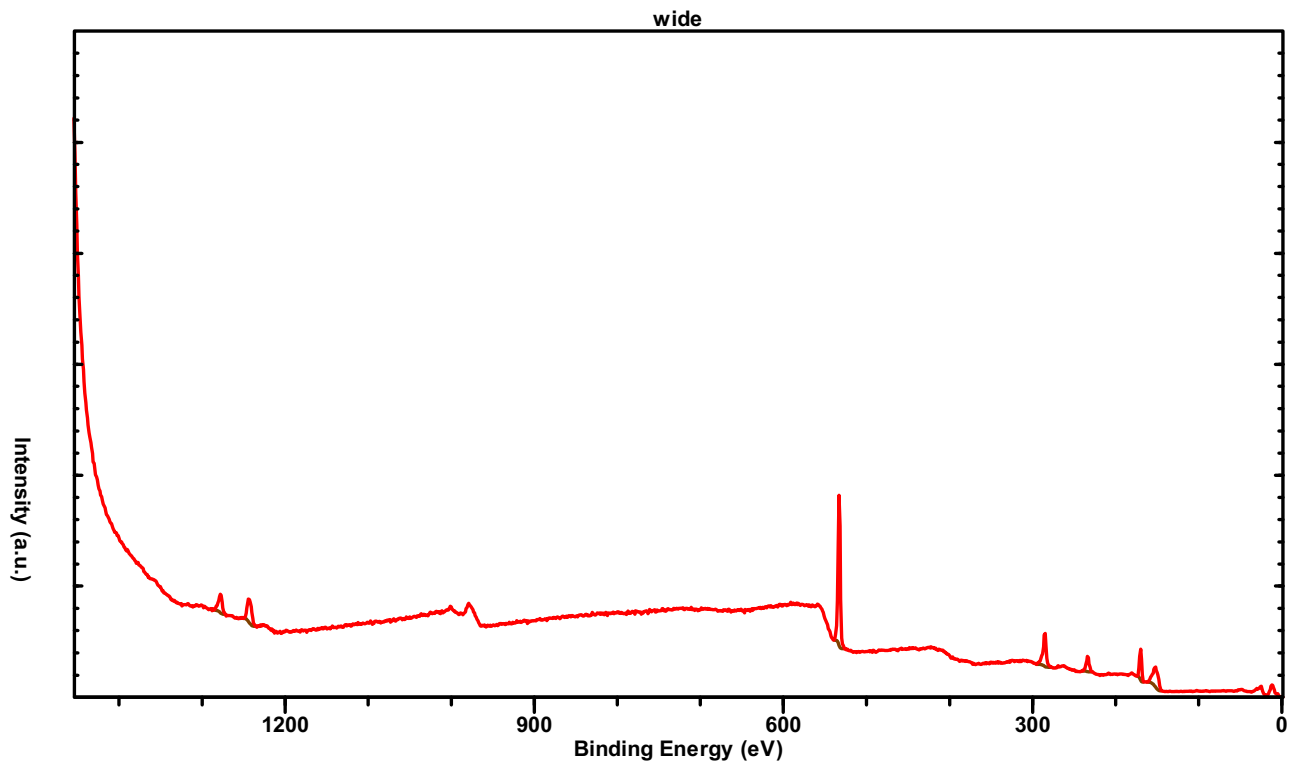
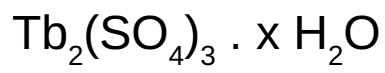




wide









wide

