1. Tables of Auger Parameter Data

Line position data from the literature that are included along with the elemental spectra for F, Na, Cu, Zn, As, Ag, Cd, In, and Te in Section II are presented as two-dimensional plots, rather than the one-dimensional binding energy charts included with the rest of the elements. While these two-dimensional plots are more useful for chemical state identification, they lack the necessary space for inclusion of some chemical states, and references cannot be included. The tabulations presented in this section are the basis for the two-dimensional charts in Section II. It should be noted that a number of chemical states included here were not incorporated in the plots.

ACKNOWLEDGEMENTS

Gratitude is expressed to Shell Development Company for the use of some unpublished energy data, and especially for permission to publish several two-dimensional chemical state plots in a form similar to that in the comprehensive paper by C. D. Wagner, L. H. Gale, and R. H. Raymond, submitted for publication.

Fluorine, F Atomic Number 9

Compound	1s	$KL_{23}L_{23}$	$\alpha + h\upsilon$	Ref.
LiF	684.9	654.9	1339.8	Φ
LiF*	684.6	655.8	1340.4	W1
$NaBF_4$	686.8	653.0	1339.8	W1
C_4F[b]	687.2	656.7	1343.9	W1
CF[b]	689.2	653.1	1342.3	W1
$(CF_2)_n$	689.1	652.1	1341.2	W3
$Ni(OOCCF_3)_2$	688.2	653.1	1341.3	W1
NaF	684.2	655.2	1339.4	W3
MgF_2	685.3	654.3	1339.6	W3
$(NH_4)_3AlF_6$	684.5	655.4	1339.9	W1
Na_3AlF_6*	685.3	654.3	1339.6	W1
K_3AlF_6*	685.1	654.4	1339.5	W1
Na_2SiF_6	685.8	653.2	1339.0	W3
$CoSiF_6$	685.8	654.5	1340.3	W1
CaF_2	684.6	655.6	1340.2	W1
Na_2TiF_6	685.1	655.3	1340.4	W3
K_2TiF_6*	684.8	655.9	1340.7	W1
MnF_2*	684.6	655.7	1340.3	W1
K_3FeF_6	683.8	656.2	1340.0	W1
$Fe(MPT)PF_6$[a]	686.1	654.3	1340.4	W1
NiF_2	684.9	655.6	1340.5	GW
NiF_2*	684.8	655.8	1340.6	W1
CuF_2	684.1	657.2	1341.3	GW
CuF_2	684.5	656.4	1340.9	W1
ZnF_2	684.3	655.8	1340.3	GW
ZnF_2*	684.8	655.8	1340.6	W3
Na_2GeF_6*	685.7	654.2	1339.9	W1
SrF_2	684.8	656.5	1341.3	W1
YF_3	685.1	656.0	1341.1	W1
Na_2ZrF_6*	684.8	655.3	1340.1	W1
K_2NbF_7*	685.2	655.4	1340.6	W1
AgF	682.5	659.5	1342.0	GW
CdF_2	684.4	656.0	1340.4	GW
CdF_2	684.2	656.4	1340.6	W1
InF_3	685.0	656.6	1341.6	W1
$NaSnF_3$*	685.1	654.6	1339.7	W1
$KSbF_6$	686.4	654.1	1339.5	W3
CsF	685.7	654.0	1339.7	W1
BaF_2	683.5	656.4	1340.0	W1
LaF_3	684.3	658.2	1342.5	W1
PrF_3	684.4	657.4	1341.8	W1
NdF_3*	684.6	657.2	1341.8	W1
SmF_3*	684.4	657.2	1341.6	W1
HfF_4*	685.2	655.5	1340.7	W1
K_2TaF_7*	685.0	655.2	1340.2	W1
PbF_2	683.4	658.7	1342.1	W1
ThF_4	684.7	657.2	1341.9	W1

*Omitted from plot because of crowding

a) MPT = $C_{27}H_{33}N_7$, a ligand with three methylpyridine rings.

b) C_4F and CF are fluorinated graphite samples.

Φ

Sodium, Na Atomic Number 11

Compound	1s	$KL_{23}L_{23}$	$\alpha + h\upsilon$	Ref.
Na	1071.5	994.4	2065.9	KL1
Na	1071.8	994.5	2066.3	BS
Na ox	1072.5	990.0	2062.5	BS
NaF	1071.1	988.8	2059.9	W3
NaCl	1071.4	990.4	2061.8	W3
NaBr	1071.6	990.8	2062.4	W3
NaI	1071.5	991.4	2062.9	W1
NaOAc	1070.8	990.2	2061.0	W3
Na_2CO_3	1071.3	990.0	2061.3	W1
$NaHCO_3$*	1071.1	990.0	2061.1	W1
NaOOCH*	1070.9	990.0	2060.9	W1
$Na_2C_2O_4$*	1070.6	990.7	2061.3	W1
Na thioglycollate*	1071.0	990.6	2061.6	W1
Na EDTA[a]*	1070.6	990.6	2061.2	W1
$NaNO_2$*	1071.4	990.0	2061.4	W3
$NaNO_3$	1071.2	989.6	2060.8	W3
$NaBF_4$	1072.5	987.3	2059.8	W3
Na_3AlF_6	1071.7	988.4	2060.1	W3
Na_2SiF_6	1071.5	987.9	2059.4	W3
Na_2TiF_6*	1071.4	988.7	2060.1	W3
Na_2GeF_6	1071.5	988.3	2059.8	W3
Na_2ZrF_6	1071.4	988.8	2060.2	W3
Na zeolite	1071.6	989.0	2060.6	W3
$NaPO_3$	1071.6	989.4	2061.0	W3
Na_2HPO_4	1071.4	990.1	2061.5	Φ
Na_2SO_3*	1071.2	990.4	2061.6	W3
$Na_2S_2O_3$*	1071.4	990.3	2061.7	W3
$Na_2S_2O_4$	1071.0	990.8	2061.8	W3
Na_2SO_4	1071.0	990.0	2061.0	W3
Na benzenesulfonate*	1071.1	989.9	2061.0	W1
Chloramine-T[b]*	1071.6	989.2	2060.8	W1
Na_2CrO_4	1071.0	991.1	2062.1	W3
$Na_2Cr_2O_7$*	1071.4	990.6	2062.0	W1
$NaAsO_2$	1070.7	990.8	2061.5	W3
Na_2SeO_3	1070.6	991.1	2061.7	W3
Na_2MoO_4*	1070.7	990.2	2060.9	W3
Na_2PdCl_4*	1071.6	990.4	2062.0	W3
$Na_2SnO_3 \cdot 3H_2O$*	1070.9	990.5	2061.4	W1
Na_2TeO_4*	1070.9	990.6	2061.5	W3
Na_2WO_4*	1071.1	990.6	2061.7	W3
$Na_2IrCl_6 \cdot 6H_2O$*	1071.7	989.4	2061.1	W3
$NaBiO_3$*	1071.1	991.1	2062.2	W1

*Omitted from plot because of crowding

a) NaEDTA = Na salt of ethylenediaminetetracetic acid

b) Chloramine-T = $CH_3C_6H_4SO_2NNaCl$

Copper, Cu Atomic Number 29

Compound	$2p_{3/2}$	$L_3M_{45}M_{45}$	$\alpha + h\upsilon$	Ref.
Cu	932.4	918.6	1851.0	Φ
Cu*	932.0	919.2	1851.2	S3
Cu*	932.4	919.0	1851.4	GW
Cu*	932.2	919.2	1851.4	MRC
Cu*	932.6	918.2	1850.8	KPM
Cu*	932.5	918.8	1851.3	FKW
Cu*	932.4	918.8	1851.2	W3
Al_2Cu	933.6	918.3	1851.9	FKW
Cu_2O	932.2	917.4	1849.6	GW
Cu_2O*	932.2	917.6	1849.8	MRC
Cu_2O*	932.2	916.9	1849.1	W3
CuCN	932.9	914.7	1847.6	W3
CuCl	932.2	915.8	1848.0	GW
CuCl	932.4	915.2	1847.6	W3
Cu_2S	932.3	917.6	1849.9	W3
$CuCO_3$	934.8	916.5	1851.3	W1
CuO	933.5	917.9	1851.4	MRC
CuO*	933.4	918.3	1851.7	GW
CuO*	933.0	917.9	1850.9	S3
CuF_2	936.8	915.0	1851.8	W1
CuF_2	935.9	916.2	1852.1	GW
$CuSiO_3$	934.7	915.4	1850.1	W1
$CuSO_4$ aq	935.3	916.1	1851.4	Φ
$CuCl_2$*	934.2	915.7	1849.9	GW
$CuCl_2$*	935.0	915.3	1850.3	W1
$CuPT(PF_6)_2$ [a]	933.8	916.1	1849.9	W1

Zinc, Zn Atomic Number 30

Compound	$2p_{3/2}$	$L_3M_{45}M_{45}$	$\alpha + h\upsilon$	Ref.
Zn	1021.4	992.4	2013.8	Φ
Zn*	1021.7	992.2	2013.9	W3
Zn*	1021.5	992.7	2014.2	S1
Zn*	1021.7	992.6	2014.3	CE
Zn*	1021.8	992.0	2013.8	KL2
Zn*	1021.6	992.0	2013.6	KPM
Zn*	1022.1	992.0	2014.1	GW
Zn*	1021.9	992.3	2014.2	HF2
Zn*	1021.4	992.5	2013.9	MD
ZnO	1021.7	988.8	2010.5	Φ
ZnO	1022.5	987.7	2010.2	GW
ZnO*	1022.5	987.6	2010.0	HF2
Zn ox	1021.8	988.2	2010.0	W3
Zn ox	1021.9	989.1	2011.0	CE
Zn $acac_2$	1021.2	987.9	2009.1	W3
ZnF_2	1022.4	986.7	2009.1	W3
ZnF_2	1022.2	986.2	2008.4	GW
ZnS	1022.4	988.2	2010.6	HF2
ZnS	1022.0	989.7	2011.7	GW
$ZnBr_2$	1023.2	987.5	2010.7	W3
ZnI_2	1022.9	988.7	2011.6	GW
$ZnPT(BF_4)_2$ [a]	1021.1	988.5	2009.6	W1
ZnTe	1022.0	991.3	2011.3	HF2

*Omitted from plot because of crowding

a) PT = ligand, $C_{24}H_{27}N_7$, containing three pyridine rings.

Φ

Arsenic, As Atomic Number 33

Compound	3d	$L_3M_{45}M_{45}$	$\alpha + h\upsilon$	Ref.
As	41.3	1225.4	1266.7	W1
As	41.3	1226.3	1267.6	RWJ
As	41.6	1225.2	1266.8	BWW
NbAs	40.6	1226.2	1266.8	BWW
GaAs	40.7	1225.6	1266.3	Φ
As_2Se_3	42.8	1223.5	1266.3	BWW
AsI_3	43.3	1223.1	1266.4	BWW
$MeAsI_2$	43.3	1222.5	1265.8	BWW
As_2S_3	43.3	1222.2	1265.5	BWW
As_4S_4	42.9	1222.9	1265.8	BWW
Ph_3As	42.2	1221.3	1263.5	BWW
Ph_3AsS	43.9	1220.2	1264.1	BWW
Me_3AsS	43.8	1219.5	1263.3	BWW
$AsBr_3$	45.1	1218.3	1263.4	BWW
As_2O_3	44.2	1219.1	1263.3	BWW
As_2O_3	44.8	1219.0	1263.8	W1
As_2O_5	46.0	1217.6	1263.6	BWW
$NaAsO_2$	44.0	1219.6	1263.6	W1
Na_2HAsO_4	45.3	1217.3	1262.6	W1
Ph_3AsO*	44.1	1219.7	1263.8	BWW
$Ph_2AsO(OH)$*	44.2	1219.2	1263.4	BWW
$PhAsO(OH)_2$*	45.0	1218.6	1263.6	BWW
$BuAsO(OH)_2$*	44.9	1218.5	1263.4	BWW
$(C_{10}H_{21})_2AsO(OH)$	43.8	1219.2	1263.0	BWW
$Me_2AsO(OH)$	44.4	1218.6	1263.0	BWW
$KAsF_6$ [a]	47.6	1214.0	1261.6	W1

*Omitted from plot because of crowding

a) Displayed at edge of chart at proper Auger parameter, although true point is off chart.

b) 6.0eV added to kinetic energy data on $M_5N_{45}N_{45}$ to obtain kinetic energy of $M_4N_{45}N_{45}$ line.

c) CdO believed hydrated.

Silver, Ag Atomic Number 47

Compound	$3d_{5/2}$	$M_4N_{45}N_{45}$	$\alpha + h\upsilon$	Ref.
Ag	367.9	358.1	726.0	Φ
Ag*	368.0	358.4	726.4	W3
Ag*	368.1	358.2	726.3	S2
Ag*	368.0	357.8[b]	725.8	GW
Ag*	367.9	358.0	725.9	FKW
$AlAg_2$	368.4	358.0	726.4	FKW
Ag_2O	367.6	356.9[b]	724.5	GW
Ag_2O	367.7	356.8	724.5	S2
AgO	367.2	356.8[b]	724.0	GW
AgO	367.4	357.4	724.8	S2
AgO	367.8	355.7	723.5	W1
AgI	367.8	356.3[b]	724.1	GW
$AgOOCCF_3$	368.6	355.3	723.9	W3
Ag_2SO_4	368.1	354.4	722.5	W3
Ag_2SO_4	367.7	355.3[b]	723.0	GW
AgF	367.5	355.5[b]	723.0	GW
AgF_2	367.1	355.8[b]	722.9	GW

Cadmium, Cd Atomic Number 48

Compound	$3d_{5/2}$	$M_4N_{45}N_{45}$	$\alpha + h\upsilon$	Ref.
Cd	404.8	383.9	788.7	Φ
Cd*	404.7	383.9	788.6	W3
Cd*	404.7	384.2[b]	788.9	GW
CdTe	404.8	382.7[b]	787.5	GW
CdSe	405.1	381.7[b]	786.8	GW
CdS	405.1	381.4[b]	786.5	GW
CdI_2	405.2	381.3[b]	786.5	GW
CdO	404.0	382.5[b]	786.5	GW
$Cd(OH)_2$ [c]	404.9	380.2	785.1	W1
CdF_2	405.7	379.1[b]	784.8	GW
CdF_2	405.6	379.0	784.6	W3

Indium, In Atomic Number 49

Compound	$3d_{5/2}$	$M_4N_{45}N_{45}$	$\alpha + h\upsilon$	Ref.
In	443.6	410.6	854.2	Φ
In	444.0	410.6	854.6	W3
In	443.6	410.9	854.5	LAK
InTe	444.1	409.4	853.5	W1
In_2Te_3	444.3	409.1	853.4	W1
InSe	444.8	408.2	853.0	W1
In_2Se_3	444.6	408.5	853.1	W1
InS	444.3	408.5	852.8	W1
In_2S_3	444.5	407.5	852.0	W3
InI_3	445.6	406.0	851.6	W3
$InBr_3$	445.8	405.0	850.8	W3
InCl	444.6	405.9	850.5	W3
$InCl_3$	445.8	404.8	850.6	W3
In_2O	444.1	407.0	851.1	W3
In_2O_3	444.7	406.9	851.6	LAK
In_2O_3	444.1	406.6	850.7	W3
In ox	445.3	406.4	851.7	W2
$In(OH)_3$	444.8	405.2	850.0	W1
InF_3	445.8	404.2	850.0	W3
$(NH_4)_3InF_6$	445.4	404.3	849.7	W3

Tellurium, Te Atomic Number 52

Compound	$3d_{5/2}$	$M_4N_{45}N_{45}$	$\alpha + h\upsilon$	Ref.
Te	572.7	492.4	1065.1	Φ
Te	573.2	491.7	1064.9	W3
Te	572.9	492.0	1064.9	BWI
Ph_2Te_2	573.7	498.7	1062.4	BWI
$PhTeI_3$	575.6	498.4	1064.0	BWI
Ph_2TeI_2	575.2	497.8	1062.9	BWI
Et_2TeI_2	575.1	497.8	1062.9	BWI
Me_2TeI_2*	575.4	497.8	1063.2	BWI
$TeBr_4$	576.5	497.5	1064.0	BWI
$PhTeBr_3$	576.4	497.0	1063.4	BWI
R^+Br^- a)	575.0	497.3	1062.3	BWI
$(FC_6H_4)TeBr_3$*	576.1	497.2	1063.3	BWI
$MeC_6H_4TeBr_2$*	575.8	496.8	1062.6	BWI
$BuTeBr_3$*	576.4	496.7	1063.1	BWI
Ph_2TeBr_2*	576.0	496.9	1062.9	BWI
TeO_2	575.9	497.3	1063.2	BWI
TeO_3	577.1	495.7	1062.8	BWI
$Te(OH)_6$	576.5	495.7	1062.2	BWI
Te ox*	576.9	496.5	1063.4	W3
Na_2TeO_4	576.6	496.5	1063.1	W3
$TeCl_4$	576.7	496.3	1063.0	BWI
Ph_2TeCl_2	576.0	496.5	1062.5	BWI
$(p\text{-}MeOC_6H_4)TeCl_3$	576.5	496.1	1062.6	BWI
Te tu_2 Cl_2	574.1	498.9	1063.0	BWI
Te tu tm Cl*	576.1	496.8	1062.9	BWI
$(NH_4)_2TeCl_6$*	576.3	497.0	1063.3	BWI
$(p\text{-}MeC_6H_4)TeOOH$	575.9	496.8	1062.7	BWI

*Omitted from plot because of crowding

a) R = (PhTe ◁)

Φ