Ionic Compound Nomenclature Self-Quiz

This page is set up with a matrix of anions and cations. Can you predict the correct formulas of the compounds formed by the combination of the various ions? Can you correctly name each of the compounds? Remember the rules of ionic nomenclature:

1. Group I and Group II and aluminum cations only have a single charge state, i.e., only form one type of cation. The cation names are the name of the metal plus the word "ion," for example, "aluminum ion."
2. All transition and p-block metals can form two or more different cations. The cation charge is incorporated into the cation name in Roman numerals enclosed in parentheses. The complete name of the cation is the metal name plus (the charge in Roman numerals enclosed in parentheses) plus the word "ion," for example, "iron (II) ion."
3. Monatomic anions are a combination of the element name, with the end of the name dropped and replaced by the suffix "ide," for example, an oxygen anion is correctly named "oxide."
4. All polyatomic cations and anions have specific names, structures, and charges that do not change.
5. The charge of any given anion is invariant, i.e., it never changes. This is true for all monatomic and polyatomic anions.
6. The charge of a transition metal cation must be deduced from the number and the charge of the anions combined with the cation in the compound.

	SO_4^{2-}	SO_3^{2-}	NO_3^-	NO_2^-	CO_3^{2-}	CrO_4^{2-}	MnO_4^-	$C_2H_3O_2^-$	PO_4^{3-}	CN^-	ClO_4^-
Na^+	Na_2SO_4	Na_2SO_3	$NaNO_3$	$NaNO_2$	Na_2CO_3	Na_2CrO_4	$NaMnO_4$	$NaC_2H_3O_2$	Na_3PO_4	NaCN	$NaClO_4$
K^+	K_2SO_4	K_2SO_3	KNO_3	KNO_2	K_2CO_3	K_2CrO_4	$KMnO_4$	$KC_2H_3O_2$	K_3PO_4	KCN	$KClO_4$
Mg^{2+}	$MgSO_4$	$MgSO_3$	$Mg(NO_3)_2$	$Mg(NO_2)_2$	$MgCO_3$	$MgCrO_4$	$Mg(MnO_4)_2$	$Mg(C_2H_3O_2)_2$	$Mg_3(PO_4)_2$	$Mg(CN)_2$	$Mg(ClO_4)_2$
Ca^{2+}	$CaSO_4$	$CaSO_3$	$Ca(NO_3)_2$	$Ca(NO_2)_2$	$CaCO_3$	$CaCrO_4$	$Ca(MnO_4)_2$	$Ca(C_2H_3O_2)_2$	$Ca_3(PO_4)_2$	$Ca(CN)_2$	$Ca(ClO_4)_2$
Ba^{2+}	$BaSO_4$	$BaSO_3$	$Ba(NO_3)_2$	$Ba(NO_2)_2$	$BaCO_3$	$BaCrO_4$	$Ba(MnO_4)_2$	$Ba(C_2H_3O_2)_2$	$Ba_3(PO_4)_2$	$Ba(CN)_2$	$Ba(ClO_4)_2$
Al^{3+}	$Al_2(SO_4)_3$	$Al_2(SO_3)_3$	$Al(NO_3)_3$	$Al(NO_2)_3$	$Al_2(CO_3)_3$	$Al_2(CrO_4)_3$	$Al(MnO_4)_3$	$Al(C_2H_3O_2)_3$	$Al_2(PO_4)_3$	$Al(CN)_3$	$Al(ClO_4)_3$
Fe^{2+}	$FeSO_4$	$FeSO_3$	$Fe(NO_3)_2$	$Fe(NO_2)_2$	$FeCO_3$	$FeCrO_4$	$Fe(MnO_4)_2$	$Fe(C_2H_3O_2)_2$	$Fe_3(PO_4)_2$	$Fe(CN)_2$	$Fe(ClO_4)_2$
Fe^{3+}	$Fe_2(SO_4)_3$	$Fe_2(SO_3)_3$	$Fe(NO_3)_3$	$Fe(NO_2)_3$	$Fe_2(CO_3)_3$	$Fe_2(CrO_4)_3$	$Fe(MnO_4)_3$	$Fe(C_2H_3O_2)_3$	$FePO_4$	$Fe(CN)_3$	$Fe(ClO_4)_3$
Cr^{2+}	$CrSO_4$	$CrSO_3$	$Cr(NO_3)_2$	$Cr(NO_2)_2$	$CrCO_3$	$CrCrO_4$	$Cr(MnO_4)_2$	$Cr(C_2H_3O_2)_2$	$Cr_3(PO_4)_2$	$Cr(CN)_2$	$Cr(ClO_4)_2$
Cr^{3+}	$Cr_2(SO_4)_3$	$Cr_2(SO_3)_3$	$Cr(NO_3)_3$	$Cr(NO_2)_3$	$Cr_2(CO_3)_3$	$Cr_2(CrO_4)_3$	$Cr(MnO_4)_3$	$Cr(C_2H_3O_2)_3$	$CrPO_4$	$Cr(CN)_3$	$Cr(ClO_4)_3$
Cr^{6+}	$Cr(SO_4)_3$	$Cr(SO_3)_3$	$Cr(NO_3)_6$	$Cr(NO_2)_6$	$Cr(CO_3)_3$	$Cr(CrO_4)_3$	$Cr(MnO_4)_6$	$Cr(C_2H_3O_2)_6$	$Cr(PO_4)_2$	$Cr(CN)_6$	$Cr(ClO_4)_6$
Pb^{2+}	$PbSO_4$	$PbSO_3$	$Pb(NO_3)_2$	$Pb(NO_2)_2$	$PbCO_3$	$PbCrO_4$	$Pb(MnO_4)_2$	$Pb(C_2H_3O_2)_2$	$Pb_3(PO_4)_2$	$Pb(CN)_2$	$Pb(ClO_4)_2$
Sn^{2+}	$SnSO_4$	$SnSO_3$	$Sn(NO_3)_2$	$Sn(NO_2)_2$	$SnCO_3$	$SnCrO_4$	$Sn(MnO_4)_2$	$Sn(C_2H_3O_2)_2$	$Sn_3(PO_4)_2$	$Sn(CN)_2$	$Sn(ClO_4)_2$
Sn^{4+}	$Sn(SO_4)_2$	$Sn(SO_3)_2$	$Sn(NO_3)_4$	$Sn(NO_2)_4$	$Sn(CO_3)_2$	$Sn(CrO_4)_2$	$Sn(MnO_4)_4$	$Sn(C_2H_3O_2)_4$	$Sn_3(PO_4)_4$	$Sn(CN)_4$	$Sn(ClO_4)_4$
Sb^{3+}	$Sb2(SO_4)_3$	$Sb2(SO_3)_3$	$Sb(NO_3)_3$	$Sb(NO_2)_3$	$Sb_2(CO_3)_3$	$Sb_2(CrO_4)_3$	$Sb(MnO_4)_3$	$Sb(C_2H_3O_2)_3$	$SbPO_4$	$Sb(CN)_3$	$Sb(ClO_4)_3$
Sb^{5+}	$Sb_2(SO_4)_5$	$Sb_2(SO_3)_5$	$Sb(NO_3)_5$	$Sb(NO_2)_5$	$Sb_2(CO_3)_5$	$Sb_2(CrO_4)_5$	$Sb(MnO_4)_5$	$Sb(C_2H_3O_2)_5$	$Sb_3(PO_4)_5$	$Sb(CN)_5$	$Sb(ClO_4)_5$

Au^{3+}	$Au_2(SO_4)_3$	$Au_2(SO_3)_3$	$Au(NO_3)_3$	$Au(NO_2)_3$	$Au_2(CO_3)_3$	$Au_2(CrO_4)_3$	$Au(MnO_4)_3$	$Au(C_2H_3O_2)_3$	$AuPO_4$	$Au(CN)_3$	$Au(ClO_4)_3$
Ag^{+}	Ag_2SO_4	Ag_2SO_3	$AgNO_3$	$AgNO_2$	Ag_2CO_3	Ag_2CrO_4	$AgMnO_4$	$AgC_2H_3O_2$	Ag_3PO_4	$AgCN$	$AgClO_4$
NH_4^{+}	$(NH_4)_2SO_4$	$(NH_4)_2SO_3$	NH_4NO_3	NH_4NO_2	$(NH_4)_2CO_3$	$(NH_4)_2CrO_4$	NH_4MnO_4	$NH_4C_2H_3O_2$	$(NH_4)_3PO_4$	NH_4CN	NH_4ClO_4
Hg_2^{2+}	Hg_2SO_4	Hg_2SO_3	$Hg_2(NO_3)_2$	$Hg_2(NO_2)_2$	Hg_2CO_3	Hg_2CrO_4	$Hg_2(MnO_4)_2$	$Hg_2(C_2H_3O_2)_2$	$(Hg_2)_3(PO_4)_2$	$Hg_2(CN)_2$	$Hg_2(ClO_4)_2$
Hg^{2+}	$HgSO_4$	$HgSO_3$	$Hg(NO_3)_2$	$Hg(NO_2)_2$	$HgCO_3$	$HgCrO_4$	$Hg(MnO_4)_2$	$Hg(C_2H_3O_2)_2$	$Hg_3(PO_4)_2$	$Hg(CN)_2$	$Hg(ClO_4)_2$
Zn^{2+}	$ZnSO_4$	$ZnSO_3$	$Zn(NO_3)_2$	$Zn(NO_2)_2$	$ZnCO_3$	$ZnCrO_4$	$Zn(MnO_4)_2$	$Zn(C_2H_3O_2)_2$	$Zn_3(PO_4)_2$	$Zn(CN)_2$	$Zn(ClO_4)_2$
Cu^{+}	Cu_2SO_4	Cu_2SO_3	$CuNO_3$	$CuNO_2$	Cu_2CO_3	Cu_2CrO_4	$CuMnO_4$	$CuC_2H_3O_2$	Cu_3PO_4	$CuCN$	$CuClO_4$
Cu^{2+}	$CuSO_4$	$CuSO_3$	$Cu(NO_3)_2$	$Cu(NO_2)_2$	$CuCO_3$	$CuCrO_4$	$Cu(MnO_4)_2$	$Cu(C_2H_3O_2)_2$	$Cu_3(PO_4)_2$	$Cu(CN)_2$	$Cu(ClO_4)_2$