

Homework 3 Answerkey

Chapter 3 - 30, 31, 35, 36, 39, 40, 41, 44, 47,
53, 55, 56, 59, 61, 63, 65, 67, 71, 76,
78, 79, 82, 83, 87, 88, 94, 95, 96, 100

30) Which formula represents ionic compounds and which represent covalent compounds?

Ionic \Rightarrow Contain metals

no metal \Rightarrow Covalent (except for NH_4^+)

- a. C_3H_8 Covalent
- b. ClBr Covalent
- c. CuO Ionic
- d. CH_4O Covalent

36) How many protons and electrons are present in each ion?

Protons \Rightarrow atomic # from periodic table

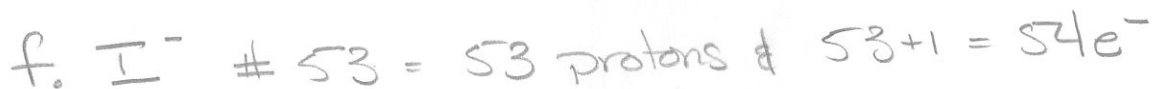
electrons \Rightarrow equal to protons add for negative charges & subtract for positive charges

a. K^+ #19 = 19 protons & $19 - 1 = 18e^-$

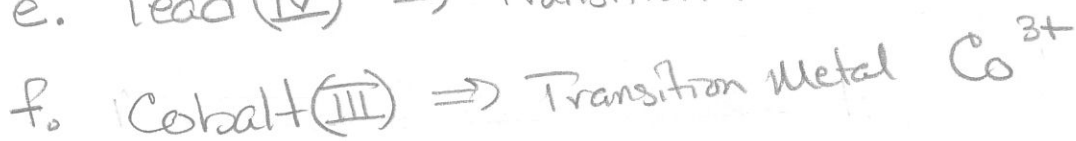
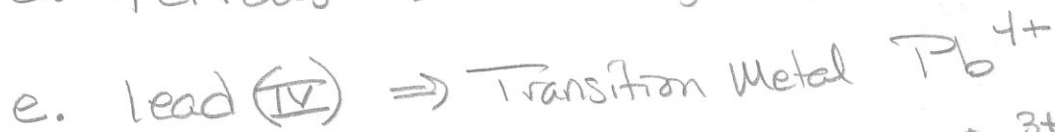
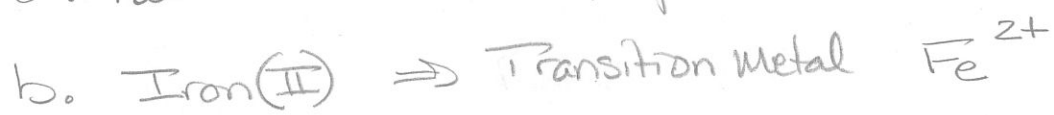
b. S^{2-} #16 = 16 protons & $16 + 2 = 18e^-$

c. Mn^{2+} #25 = 25 protons & $25 - 2 = 23e^-$

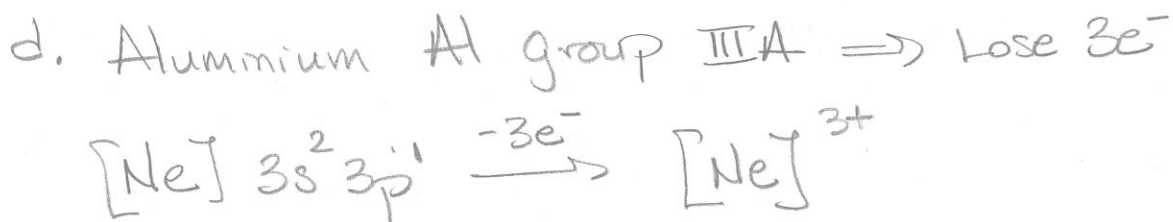
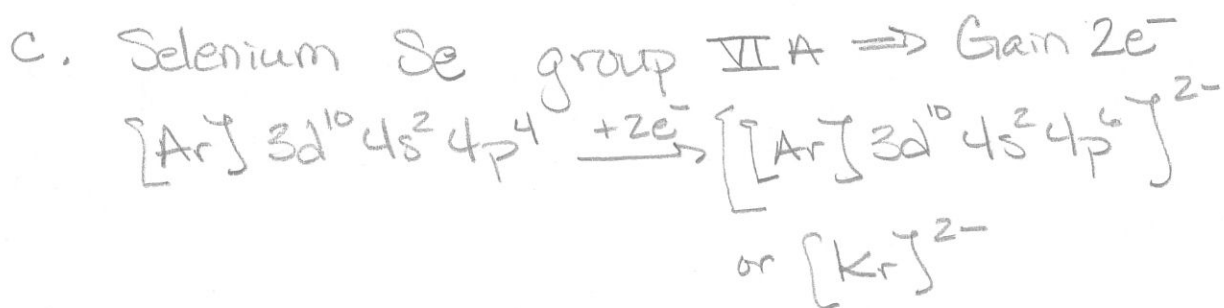
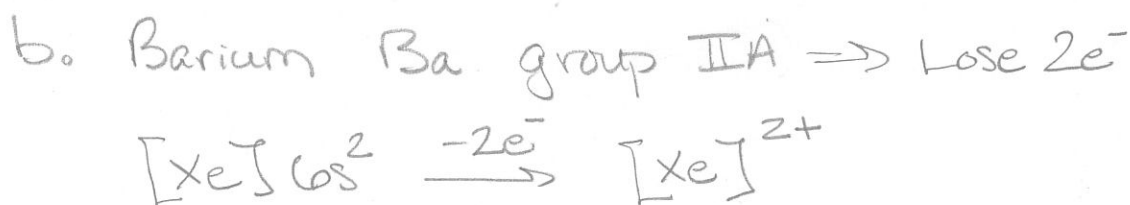
36) cont



40) Give the ion symbol for each ion.

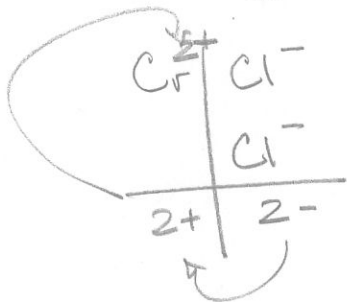


44) How many electrons must be gained or lost by each element to achieve a noble gas configuration of electrons?



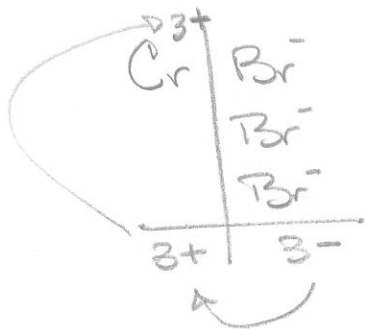
76) Name each ionic compound

a. $\text{CrCl}_2 \Rightarrow$ Transition metal



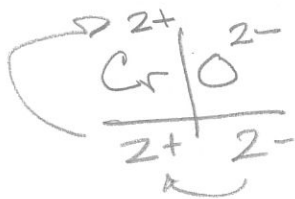
Chromium(II) chloride
or
Chromous chloride

b. $\text{CrBr}_3 \Rightarrow$ Transition metal



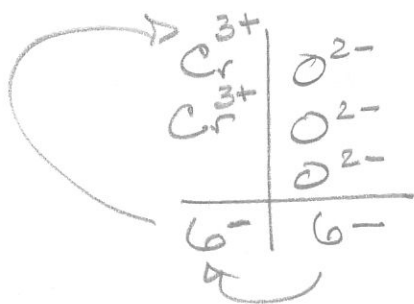
Chromium(III) bromide
or
Chromic bromide

c. $\text{CrO} \Rightarrow$ Transition metal



Chromium(II) oxide
or
Chromous oxide

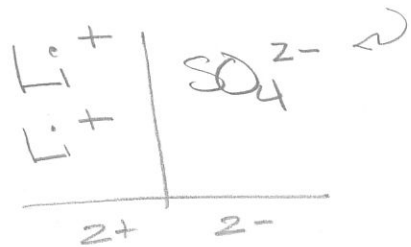
d. $\text{Cr}_2\text{O}_3 \Rightarrow$ Transition metal



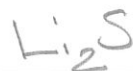
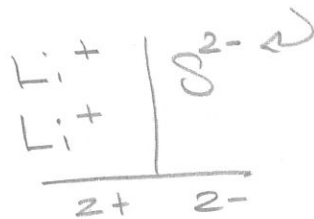
Chromium(III) oxide
or
Chromic oxide

78) Write formulas to illustrate the differences between each pair of compounds.

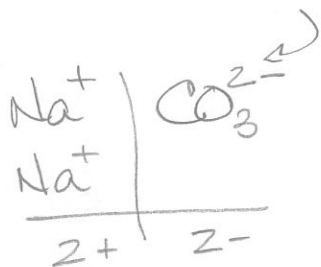
a. lithium Sulfate



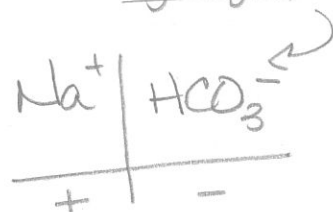
lithium Sulfide



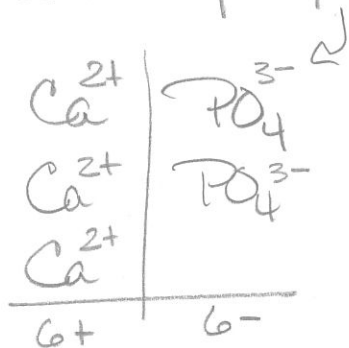
b. Sodium Carbonate



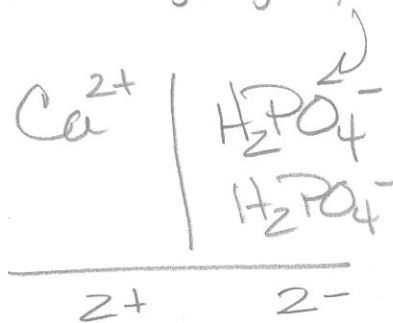
Sodium hydrogen Carbonate



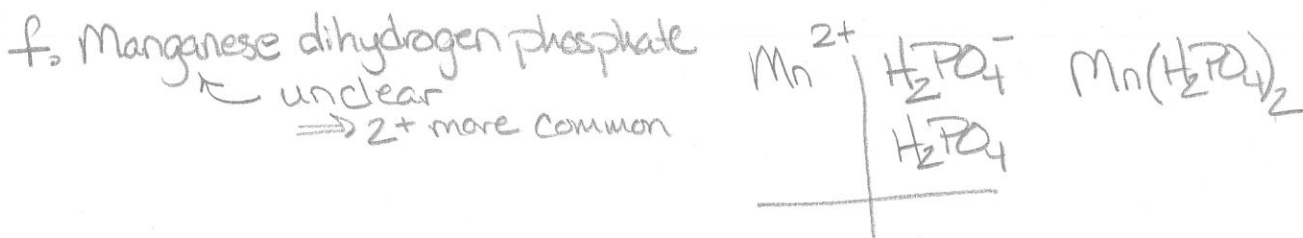
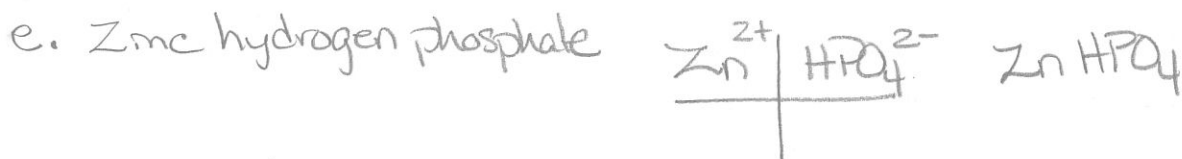
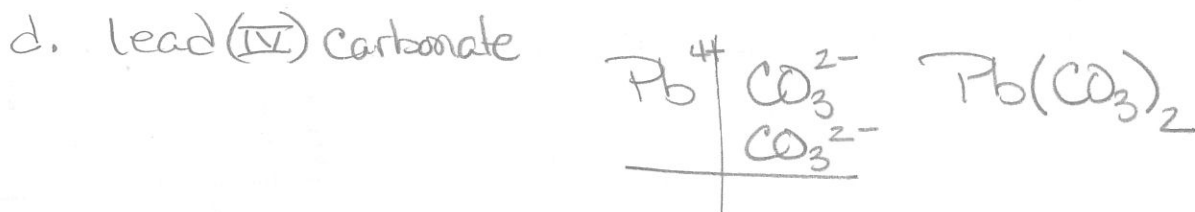
c. Calcium phosphate



Calcium dihydrogen phosphate

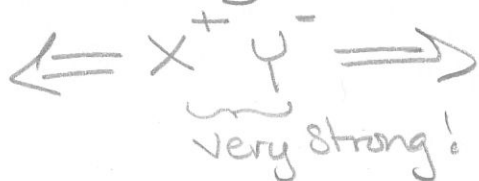


82) Write a formula for each name

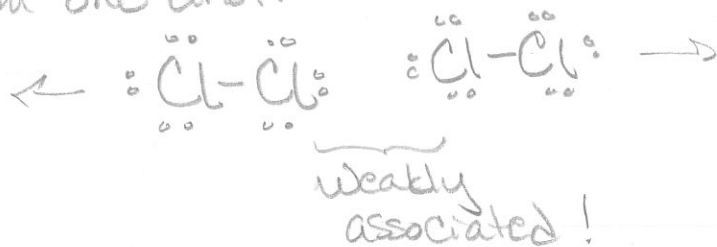


88) Which compound or element has the lowest boiling point: Cl_2 , KI , LiF

Due to electrostatic attraction, ionic materials have extremely high boiling points. It takes a lot of energy to melt an ionic material.

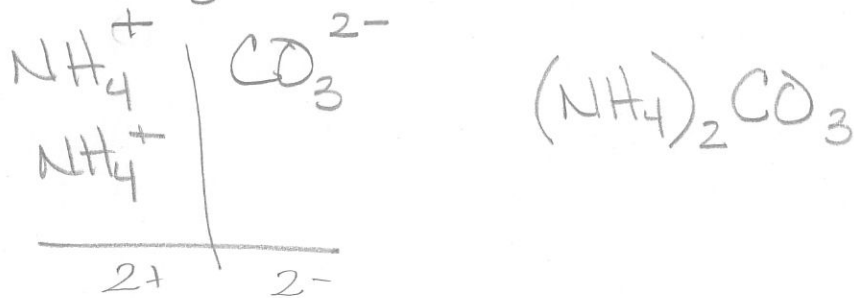


On the other hand, covalent materials have much weaker intermolecular attractive forces. it takes much less energy to pull two molecules apart from one another



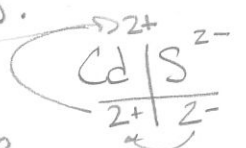
Thus Chlorine would be expected to have the lowest boiling point.

94) Ammonium Carbonate is the active ingredient in Smelting Salts. Write its formula.

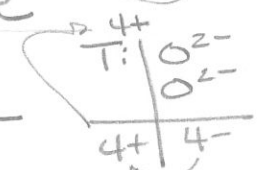


96) Name each of the following Pigments.

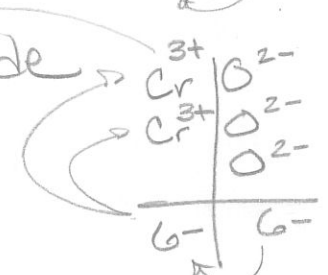
a. CdS (yellow) Cadmium(II) Sulfide



b. TiO_2 (white) Titanium(IV) Oxide

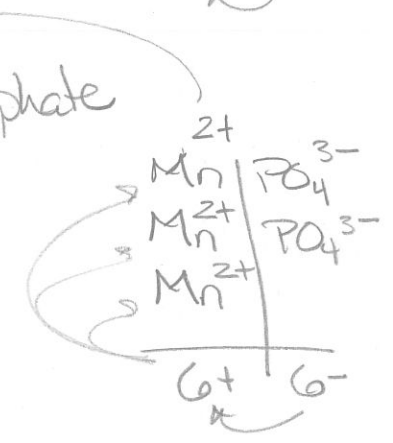


c. Cr_2O_3 (white) Chromium(III) Oxide

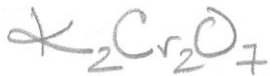
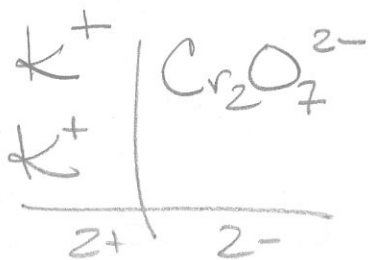


d. $\text{Mn}_3(\text{PO}_4)_2$ (purple)

Manganese(II) Phosphate



100) Some polyatomic ions contain a metal as part of the anion. For example, the anion dichromate has the formula $\text{Cr}_2\text{O}_7^{2-}$ and the anion permanganate has the formula MnO_4^- . Write the formula of the ionic compound formed from each of these anions and potassium cation. Name each compound.



Potassium dichromate



Potassium permanganate