

## In Class Assignment 1: The Periodic Table and Some Review

(You can use your book to help you)

### The Periodic Table

Label the following on your periodic table:

- Metals
- Non-metals
- Metalloids (or semi-metals)
- Transition metals
- Lanthanides
- Actinides
- Main group elements
- Halogens
- Alkali metals
- Alkaline earth metals
- Chalcogens
- Noble gases
- Groups (I-VIIIA)
- Periods (1-7)
- Atoms that commonly form +1, +2, +3 ions (not all of them, just the obvious ones based on the periodic table)
- Atoms that commonly form -1, -2, -3 ions

see periodic  
table

What combinations of two elements generally give ionic compounds? metal +

non metal

What combinations of two elements generally give covalent compounds?

non metal  
+ non metal

What is the group number of radon? VIIIA or 18

What is the special group on the periodic table that is rubidium a member of?

alkali  
metals

What is the name of the halogen in period 5? iodine

Is antimony a metal, a non-metal or a metalloid? metalloid

What is the name of the alkali metal in period 3? sodium

Classify the element selenium in as many ways as you can: main group,  
non metal, -2 ion,  
chalcogen

all the A groups  
alkali metals are main group elements

Group 1  
↓  
alkali metals  
+1  
period 1

-3 -2 -1  
chalcogens halogens noble gases

+3  
11A 12A 13A 14A 15A 16A 17A 18A  
metalloids

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 H	2 He	3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne	11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo

transition metals

metals

58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

← Lanthanides

← Actinides

### Some Review: Protons, Neutrons, and Electrons

Consider the radioactive element technetium that is used as a medical imaging agent:  
How many protons, neutrons, and electrons does  $^{99}\text{Tc}$  have?

For  $^{99}\text{Tc}$ , what is its mass number? 99

What is its atomic number? 43

Which one of these makes it "technetium"? atomic #

Technetium has three common positive "oxidation states" (charges): +2, +3, and +7.  
How many protons, neutrons, and electrons does each of these have if it is still the  $^{99}\text{Tc}$  isotope?

	$p^+$	$n^0$	$e^-$
$^{99}\text{Tc}^{2+}$ :	43	56	41
$^{99}\text{Tc}^{3+}$ :	43	56	40
$^{99}\text{Tc}^{7+}$ :	43	56	36

How is the atomic mass that is listed on the periodic table for an element related to the mass numbers of individual isotopes like  $^{99}\text{Tc}$ ?

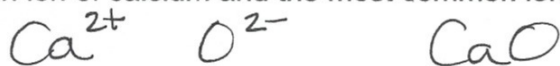
weighted average  $\rightarrow$  mass #  $\times$  % abundance  
added together for all

### Writing Formulas for Ionic Compounds

When you write a formula for an ionic compound, you need to take the charges into account so that the compound you form has a neutral charge. For instance, if you are forming a compound between  $\text{Al}^{3+}$  and the sulfate ion ( $\text{SO}_4^{2-}$ ), the total positive charge and negative charge must balance, so you need 2  $\text{Al}^{3+}$  and 3  $\text{SO}_4^{2-}$  ions:  $\text{Al}_2(\text{SO}_4)_3$ . Notice that when you write the formula for the neutral compound, the charges are not included. Always write the cation before the anion in the formula!

Write the formulas for the ionic compounds formed by the combination of the following:

The most common ion of calcium and the most common ion of oxygen:



The most common ion of chlorine and the ion of iron with 23 electrons:



The most common ion of zinc and the polyatomic ion nitrate:

