Chem 130 *Coastline College*
Fall 2016 *Dupon*

Homework Set 3 Solutions

(Distributed 9/14/16; Due on 9/21/16)

Read Chapter 4 in Zumdahl and complete the listed questions from the text: Chapter 4: 35, 38, 42, 51, 73, 75, 78, 94; as well as the following problems:

A. Identify each of the following as either an element or a compound:
(i) boron nitride BN ***Compound*** (ii) baking powder, sodium carbonate ***compound***

(iii) iodine, I_2 ***element*** (iv) red phosphorus, P_4 ***element***

B. Write the symbol for the element:
(i) gadolinium (ii) tungsten (iii) arsenic (iv) mercury (v) tin
Gd ***W*** ***As*** ***Hg*** ***Sn***

C. Complete the following table for neutral atoms:

Isotope Symbol	# protons	# neutrons	# electrons
$^{239}_{92}U$	92	***147***	***92***
$^{19}_{10}Ar$	10	9	10
$^{75}_{35}Br$	***35***	***40***	35
$^{19}_{9}F$	9	10	9
$^{30}_{15}P$	***15***	15	***15***

D. Identify the ion indicated by the following information:
(i) 15 p, 18e ***P^{3-}*** (ii) 35 p, 36 e ***Br^{-}***

(iii) 48 p, 46 e ***Cd^{2+}*** (iv) 56 p, 54e ***Ba^{2+}***

(v) 13 p, 10 e ***Al^{3+}***

E. Write the formula for the ionic compound formed by each of the following ions:
(i) Mg^{2+} + S^{2-} ***MgS*** (ii) Rb^{+} + O^{2-} ***Rb_2O***

(iii) Ca^{2+} + P^{3-} ***Ca_3P_2*** (iv) Al^{3+} + I^{-} ***AlI_3***

Problems from Zumdahl:

Chapter 4:

35.

Atomic number	Symbol	Name
8	O	Oxygen
29	Cu	Copper
78	Pt	Platinum
15	P	Phosphorus
17	Cl	Chlorine
50	Sn	Tin
30	Zn	zinc

38. a. ${}^{54}_{26}Fe$ b. ${}^{56}_{26}Fe$ c. ${}^{57}_{26}Fe$ d. ${}^{14}_{7}N$ e. ${}^{15}_{7}N$ f. ${}^{15}_{7}N$

42

Name	***Symbol***	***Atomic Number***	***Mass number***	***# of neutrons***
Oxygen	${}^{17}_{8}O$	8	17	9
Oxygen	${}^{17}_{8}O$	8	17	9
Neon	${}^{20}_{10}Ne$	10	20	10
Iron	${}^{56}_{26}Fe$	26	56	30
Plutonium	${}^{244}_{94}Pu$	94	244	150
Mercury	${}^{202}_{80}Hg$	80	202	122
Cobalt	${}^{59}_{27}Co$	27	59	32
Nickel	${}^{56}_{28}Ni$	28	56	28
Fluorine	${}^{19}_{9}F$	9	19	10
Chromium	${}^{50}_{24}Cr$	24	50	26

51. a. Group 1, alkali metals b. Group 2, alkaline earth elements
c. Group 8, noble gases d. Group 7, halogens
e. Group 2, alkaline earth elements f. Group 8, noble gases
g. Group 1, alkali metals

73. a. 54 b. 18 c. 23 d. 10 e. 54 f. 80

75. a. Ca: 20p, 20e; Ca^{2+}: 20p, 18 e
b. P: 15 p, 15 e; P^{3-}: 15p, 18e
c. Br: 35p, 35 e ; Br^{-}: 35 p, 36 e
d. Fe: 26 p, 26e; Fe^{3+}: 26p, 23e

e. N: 7p, 7e; N^{3-}: 7p, 10 e

78. a. P^{3-} b. Ra^{2+} c. At^{-} d. no ion e. Cs^{+} f. Se^{2-}

94. a. 29 protons, 34 neutrons, 29 electrons
b. 35 protons, 45 neutrons, 35 electrons
c. 12 protons, 12 neutrons, 12 electrons