INTRODUCTION TO NATURAL SCIENCE

CHEMISTRY HOMEWORK - WEEK 3 - FALL 2006

Chapter 2

(40) (a) N (nitrogen) (b) Na (sodium)
(c) Cl (chlorine) (d) neon (Ne)

(42) (a) Bk (b) Br (c) B (d) Ba (e) Bi

(45)

Symbol	^{58}Ni	^{33}S	^{20}Ne	^{55}Mn
# of p	28	16	10	25
# of n	30	17	10	30
# of e	28	16	10	25
name	nickel	sulfur	neon	manganese

(48)

1 S	2 N
3 B	4 I

for tin Sn ← n should be lower case
for bismuth Bi ← i should be lower case.
∴ Ignore cases for this problem.

(50) diamond and graphite are the other allotropes of carbon

(53) (a) beryllium (b) sodium (c) carbon (d) sulfur
(e) iodine (f) magnesium (g) krypton
(h) sulfur (i) germanium

carbon - allotropes are graphite, diamond and C_{60}

oxygen - allotropes are O_2 and O_3 (ozone)

[No need to describe each of the allotropes]

(57) (a) $0.5\ mol\ Na \times \frac{22.98\ g}{1\ mol\ Na} = 11.49\ g$

$0.5\ mol\ Si \times \frac{28.09\ g}{1\ mol\ Si} = 14.04\ g$ has more mass

(b) 0.5 mol Na has more mass

(c) $10\ atoms\ Fe \times \frac{1\ mol}{6.02 \times 10^{23}\ atoms} \times \frac{55.85\ g}{1\ mol} = 9.28 \times 10^{-22}\ g$

has more mass

$10\ atoms\ K \times \frac{1\ mol}{6.02 \times 10^{23}\ atoms} \times \frac{39.09\ g}{1\ mol} = 6.49 \times 10^{-22}\ g$

(62) $15\ mg\ Fe \times \frac{1\ g}{1000\ mg} \times \frac{1\ mol\ Fe}{55.85\ g} = 2.7 \times 10^{-4}\ mol\ Fe$

$2.7 \times 10^{-4}\ mol\ Fe \times \frac{6.02 \times 10^{23}\ atoms}{1\ mol} = 1.62 \times 10^{20}\ Fe\ atoms$

Chapter 3

(7) (a) Ba^{2+} (b) Ti^{4+} (c) PO_4^{3-} (d) HCO_3^- (e) S^{2-}
(f) ClO_4^- (g) Co^{2+} (h) SO_4^{2-}

(13) (a) two K^+ and one S^{2-}
(b) one Co^{2+} and one SO_4^{2-}
(c) One K^+ and one MnO_4^-
(d) three NH_4^+ and one PO_4^{3-}
(e) one Ca^{2+} and two ClO_2^-

(16) (a) $PtCl_2$ and $PtCl_4$

(b) PtS and PtS_2

(19) (a) potassium sulfide
(b) cobalt (II) sulfate
(c) ammonium phosphate
(d) calcium chlorite

(21) (a) $(NH_4)_2CO_3$ (b) CaI_2 (c) $CuBr_2$

(d) $AlPO_4$ (e) $AgH_3C_2O_2$ or ~~Ag~~ CH_3COOAg