CHEM I REVIEW - CHANG, Chpt. 2

7, 15, 17, 31, 35, 43, 49, 57, 59, 61, 69, 75, 89

2.7 $-1\ \text{cm} \times \frac{10^{12}\ \text{pm}}{10^2\ \text{cm}} \times \frac{1\ \text{atom}}{10^2\ \text{pm}} = 10^8$ atoms (100 000 000 atoms) or 1×10^8 atoms

2.15

	p^+	n
^3_2He	2	1
^4_2He	2	2
$^{24}_{12}Mg$	12	12
$^{25}_{12}Mg$	12	13
$^{48}_{22}Ti$	22	26
$^{79}_{35}Br$	35	44
$^{195}_{78}Pt$	78	117

2.17 (a) $^{23}_{11}Na$ (b) $^{64}_{28}Ni$

2.31 diatomic = c, polyatomic = a b c, not compounds = a

compounds = b & c element = a

2.35

	p^+	e^-
Na^+	11	10
Ca^{2+}	20	18
Al^{3+}	13	10
Fe^{2+}	26	24
I^-	53	54
F^-	9	10
S^{2-}	16	18
O^{2-}	8	10
N^{3-}	7	10

2.43 (a) sodium oxide = Na_2O (b) iron (II) sulfide = FeS (c) cobalt sulfate = $Co_2(SO_4)_3$ (d) barium fluoride = BaF_2

2.49 ionic = LiF, $BaCl_2$, KCl molecular (covalent) = $SiCl_4$, B_2H_6, C_2H_4

2.57
(a) sodium chromate
(b) potassium hydrogen phosphate
(c) hydrogen monobromide
(d) hydrobromic acid
(e) lithium carbonate
(f) potassium dichromate
(g) ammonium nitrite
(h) phosphorus trifluoride
(i) phosphorus pentafluoride
(j) tetraphosporus hexoxide
(k) cadmium (II) iodide
(l) strontium sulfate
(m) aluminum hydroxide
(n) sodium carbonate decahydrate

2.59

(a) $RbNO_2$
(b) K_2S
(c) $NaHS$
(d) $Mg_3(PO_4)_2$
(e) $CaHPO_4$
(f) KH_2PO_4
(g) IF_7
(h) $(NH_4)_2SO_4$
(i) $AgClO_4$
(j) BCl_3

2.61

SF_6 SF_n

1g S: 3.55g F   1g S: 2.37g F

$$\frac{2.37g}{3.55g} = \frac{n}{6}$$

$$n = \frac{6 \cdot 2.37}{3.55} = 4$$

$n = 4$ (SF_4)

2.69

	(a)	(b)	(c)	(d)
molecular formula	C_3H_8	C_2H_2	C_2H_6	C_6H_6
empirical formula	C_3H_8	CH	CH_3	CH

2.75

(a) BaO barium oxide
(b) Ca_3P_2 calcium phosphide
(c) Al_2S_3 aluminum sulfide
(d) Li_3N lithium nitride

2.89

	p^+	n	Ratio $(\frac{n}{p^+})$
$^{4}_{2}He$	2	2	1.0
$^{20}_{10}Ne$	10	10	1.0
$^{40}_{18}Ar$	18	22	$1.\overline{2}$
$^{84}_{36}Kr$	36	48	$1.\overline{3}$
$^{132}_{54}Xe$	54	78	$1.\overline{4}$

Generally As the atomic number increases, the ratio of n to p^+ increases.

(More specific - once we reach the 3rd energy level, n/p^+ jumps by about 2/9 for Ar, then by successive 1/9 increments.)