Chapter 2: 26, 27, 49, 57, 59, 61, 64, 65, 68, 74, 76, 77, 80

26. $Cl_2 + 3\ F_2 \longrightarrow$ 2 products

Must balance: 2 Cl and 6 F in 2 molecules of product. Dividing by 2, gives 1 Cl and 3 F in 1 molecule of product: ClF_3 (most metallic element given first).

$Cl_2 + 3\ F_2 \longrightarrow 2\ ClF_3$

27.

H		N	
0.144	:	1	hydrazine
0.216	:	1	ammonia
0.0240	:	1	hydrogen azide

$\frac{0.216}{0.144} = 1.5 \times 2 = 3$ Small, whole number combining ratio

$\frac{0.216}{0.0240} = 9$ Small, whole number combining ratio

$\frac{0.144}{0.0240} = 6$ Small, whole number combining ratio

Hydrazine is actually N_2H_4
Ammonia is actually NH_3
Hydrogen azide is actually HN_3

The ratio of H in N_2H_6 (2 x NH_3) to H in N_2H_4 (same number of N's) is 6/4 or 1.5.

The ratio of H in N_6H_{18} (6 x NH_3) to H in H_2N_6 (same number of N's) is 18/2 or 9.

The ratio of H in N_6H_{12} (3 x N_2H_4) to H in H_2N_6 (same number of N's) is 12/2 or 6.

49.

isotope	protons	neutrons	electrons	charge
$^{238}_{92}U$	92	146	92	0
$^{40}_{20}Ca^{2+}$	20	20	18	2+
$^{51}_{23}V^{3+}$	23	28	20	3+
$^{89}_{39}Y$	39	50	39	0
$^{79}_{35}Br^{-}$	35	44	36	1–
$^{31}_{15}P^{3-}$	15	16	18	3–

57.

a. cesium fluoride
b. lithium nitride
c. silver(I) sulfide
d. manganese(IV) oxide
e. titanium(IV) oxide
f. strontium phosphide

59.

a. barium sulfite
b. sodium nitrite
c. potassium permanganate
d. potassium dichromate

61.

a. dinitrogen tetroxide
b. iodine trichloride
c. sulfur dioxide
d. diphosphorus pentasulfide

64.

a. acetic acid
b. ammonium nitite
c. cobalt(III) sulfide
d. iodine monochloride
e. lead(II) phosphate
f. potassium iodate
g. sulfuric acid
h. strontium nitride
i. aluminum sulfite
j. tin(IV) oxide
k. sodium chromate
l. hypochlorous acid

65.

a. SF_2
b. SF_6
c. NaH_2PO_4
d. Li_3N
e. $Cr_2(CO_3)_3$
f. SnF_2
g. $NH_4C_2H_3O_2$
h. NH_4HSO_4
i. $Co(NO_3)_3$
j. Hg_2Cl_2
k. $KClO_3$
l. NaH

68.

a.	$(NH_4)_2HPO_4$	g.	HBr	
b.	Hg_2S	h.	$HBrO_2$	
c.	SiO_2	i.	$HBrO_4$	
d.	Na_2SO_3	j.	KHS	
e.	$Al(HSO_4)_3$	k.	CaI_2	
f.	NCl_3	l.	$CsClO_4$	

74.

a.	Fe^{2+}	p^+ 26	e^- 24	FeO
b.	Fe^{3+}	p^+ 26	e^- 23	Fe_2O_3
c.	Ba^{2+}	p^+ 56	e^- 54	BaO
d.	Cs^+	p^+ 55	e^- 54	Cs_2O
e.	S^{2-}	p^+ 16	e^- 18	Al_2S_3
f.	P^{3-}	p^+ 15	e^- 18	AlP
g.	Br^-	p^+ 35	e^- 36	$AlBr_3$
h.	N^{3-}	p^+ 7	e^- 10	AlN

76.

a. Te
b. Rb
c. Ar
d. At

77. X^{2+}, ion has 86 e^-, atom has 88 e^- and 88 p^+. The atom is <u>Ra</u>. 230 - 88 = <u>142 n^o</u>.

80. sodium arsenate
arsenic acid
magnesium antimonate