

Homework Set 4 Solutions

(Distributed 9/28/16; Due on 10/5/16)

Read Chapters 5 & 6 in Zumdahl and complete the listed questions from the text:
Chapter 5: 19, 36, 40, 42, 49; Chapter 6: 39, 73, 78; as well as the following problems:

A. Complete the table below with the missing ion, formula or name:

Cation	Anion	Ionic Formula	Name
Sr^{2+}	N^{3-}	Sr_3N_2	Strontium nitride
NH_4^+	CO_3^{2-}	$(\text{NH}_4)_2\text{CO}_3$	Ammonium carbonate
Na^+	ClO_4^-	NaClO_4	Sodium perchlorate
K^+	$\text{Cr}_2\text{O}_7^{2-}$	$\text{K}_2\text{Cr}_2\text{O}_7$	Potassium dichromate
Ca^{2+}	PO_4^{3-}	$\text{Ca}_3(\text{PO}_4)_2$	Calcium phosphate

B. Write the name or formula for the following molecular compounds:

(i) BrF_3 **bromine trifluoride** (ii) dinitrogen pentoxide N_2O_5

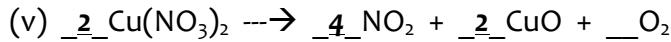
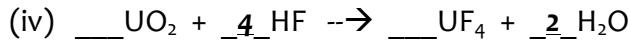
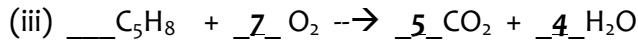
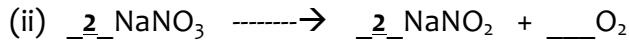
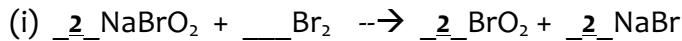
(iii) P_4O_{10} **tetraphosphorus decoxide** (iv) carbon tetrachloride CCl_4

(v) Selenium hexafluoride SeF_6

C. Suggest three different indications that a chemical reaction has occurred.

1) color change 2) gas emission 3) precipitate formation

D. Balance the chemical reactions shown:



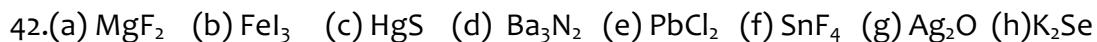
Problems from Zumdahl:

Chapter 5:

19. (a) iron(II) phosphide (I)
(c) dinitrogen pentoxide (NI)
(e) disulfur decafluoride (NI)
- (b) calcium bromide (I)
(d) lead (IV) chloride (I)
(f) copper (I) oxide (I)

- 36.(a) sodium permanganate
(c) Chromium (II)carbonate
(e) barium carbonate
- (b) aluminum phosphate
(d)calcium hypochlorite
(f) calcium chromate

- 40.(a) hypochlorous acid
(c) bromic acid
(e) perbromic acid
(g) hydroselenic acid
- (b) sulfurous acid
(d) hypoiodous acid
(f) hydrosulfuric acid
(h) phosphorous acid



49. (a) Na_2O_2 (b) $Ca(ClO_3)_2$ (c) $RbOH$ (d) $Zn(NO_3)_2$ (e) $(NH_4)_2Cr_2O_7$ (f) H_2S
(g) $CaBr_2$ (h) $HOCl$ (i) K_2SO_4 (j) HNO_3 (k) $Ba(C_2H_3O_2)_2$ (l) Li_2SO_3

Chapter 6:

39. (a) $K_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2 KCl$
(b) $Fe + H_2O \rightarrow FeO + H_2$
(c) $NaOH + HClO_4 \rightarrow NaClO_4 + H_2O$
(d) $3 Mg + Mn_2O_3 \rightarrow 3 MgO + 2 Mn$
(e) $2 KOH + KH_2PO_4 \rightarrow K_3PO_4 + 2 H_2O$
(f) $4 NO_2 + 2 H_2O + O_2 \rightarrow 4 HNO_3$
(g) $2 BaO_2 + 2 H_2O \rightarrow 2 Ba(OH)_2 + O_2$
(h) $4 NH_3 + 5 O_2 \rightarrow 4 NO + 6 H_2O$

- 73 .(a) $Cl_2 + 2 KBr \rightarrow Br_2 + 2 KCl$
(b) $4 Cr + 3 O_2 \rightarrow 2 Cr_2O_3$
(c) $P_4 + 6 H_2 \rightarrow 4 PH_3$
(d) $2 Al + 3 H_2SO_4 \rightarrow Al_2(SO_4)_3 + 3 H_2$
(e) $PCl_3 + 3 H_2O \rightarrow H_3PO_3 + 3 HCl$
(f) $2 SO_2 + O_2 \rightarrow 2 SO_3$
(g) $C_7H_{16} + 11 O_2 \rightarrow 7 CO_2 + 8 H_2O$
(h) $2 C_2H_6 + 7 O_2 \rightarrow 4 CO_2 + 6 H_2O$

