

Answers to Even # Homework Problems (8th Edition)

Chapter 4

4.20 Mg^{+2} , F^{-1} , Al^{+3} , S^{-2} , K^{+1} , Br^{-1}

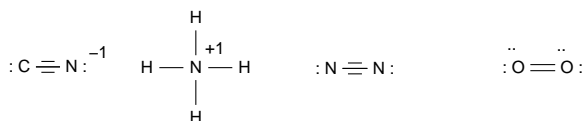
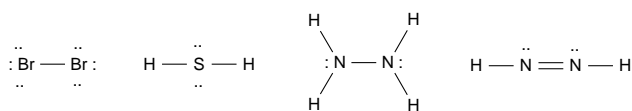
4.34

LiBr	LiClO ₄	Li ₂ O	LiNO ₃	Li ₂ SO ₄	Li ₃ PO ₄	LiOH
CaBr ₂	Ca(ClO ₄) ₂	CaO	Ca(NO ₃) ₂	CaSO ₄	Ca ₃ (PO ₄) ₂	Ca(OH) ₂
CoBr ₃	Co(ClO ₄) ₃	Co ₂ O ₃	Co(NO ₃) ₃	Co ₂ (SO ₄) ₃	CoPO ₄	Co(OH) ₃
KBr	KClO ₄	K ₂ O	KNO ₃	K ₂ SO ₄	K ₃ PO ₄	KOH
CuBr ₂	Cu(ClO ₄) ₂	CuO	Cu(NO ₃) ₂	CuSO ₄	Cu ₃ (PO ₄) ₂	Cu(OH) ₂

4.38 (a) Ca^{+2} , S^{-2} (b) Mg^{+2} , F^{-1} (c) Cs^{+1} , O^{-2} (d) Sc^{+3} , Cl^{-1} (e) Al^{+3} , S^{-2}

4.48 KBr, CaO, HgO, Cu₃(PO₄)₂, Li₂SO₄, Fe₂S₃

4.50 N=3, F=1, C=4, Br=1, O=2



4.56

4.102 (a) cadmium(II) sulfide (b) chromium(III) oxide (c) titanium(IV) oxide
(d) manganese(II) phosphate (e) cobalt(III) oxide (f) iron(III) oxide

4.106 (a) Wrong. Left carbon has five bonds
(b) Wrong. Middle carbon has only three bonds
(c) Wrong. Middle carbon has only 3 bonds, and O has only 1
(d) Wrong. F has two bonds (not one)
(e) OK
(f) Wrong. Second carbon has five bonds

Chapter 5

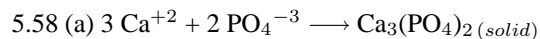
5.18 (a) 210.1 (b) 342.2 (c) 96.1

5.20 (a) $32g * \frac{\text{mole } CH_4}{16.0g} = 2.0 \text{ moles}$
(b) $345.6g * \frac{\text{mole } NO}{30.0g} = 11.5 \text{ moles}$
(c) $184.4g * \frac{\text{mole } ClO_2}{67.45g} = 2.734 \text{ moles}$
(d) $720g * \frac{\text{mole } C_3H_8O_3}{92.1g} = 7.8 \text{ moles}$

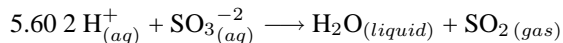
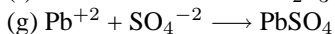
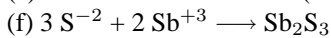
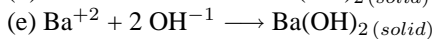
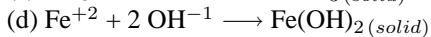
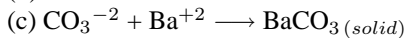
5.30 (a) Already balanced
(b) $Ba(NO_3)_2 + H_2S \rightarrow BaS + 2 HNO_3$
(c) $CH_4 + 2 O_2 \rightarrow CO_2 + 2 H_2O$
(d) $2 C_4H_{10} + 13 O_2 \rightarrow 8 CO_2 + 10 H_2O$
(e) $2 Fe + 3 CO_2 \rightarrow Fe_2O_3 + 3 CO$

5.46 $421g C_2H_6O * \frac{1 \text{ mol } C_2H_6O}{46.1g} * \frac{3 \text{ mol } O_2}{1 \text{ mol } C_2H_6O} * \frac{32.0g O_2}{1 \text{ mol } O_2} = 877 g O_2$

5.56 (a) Already balanced
(b) Already balanced
(c) $2 Sc_{(aq)}^{+3} + 3 SO_{4(aq)}^{-2} \rightarrow Sc_2(SO_4)_3(solid)$
(d) $Sn_{(aq)}^{+2} + 2 Fe_{(aq)}^{+2} \rightarrow Sn(solid) + 2 Fe_{(aq)}^{+3}$
(e) $2 K_{(solid)} + 2 H_2O_{(liquid)} \rightarrow 2 K_{(aq)}^{+} + 2 OH_{(aq)}^{-1} + H_2(gas)$



(b) NR



5.62 (a) KCl = soluble (b) NaOH = soluble (c) BaSO₄ = insoluble

(d) Na₂SO₄ = soluble (e) Na₂CO₃ = soluble (f) Fe(OH)₂ = insoluble

5.66 Pb is oxidized, Ag⁺¹ is reduced, so

Pb is the reducing agent and Ag⁺¹ is the oxidizing agent

5.70 (a) endothermic (b) exothermic (c) exothermic (d) endothermic (e) exothermic

5.74 $\text{Glucose} = \frac{670 \text{ kcal}}{\text{mole}} * \frac{1 \text{ mole glucose}}{180.2 \text{ grams}} = 3.72 \frac{\text{kcal}}{\text{gram}}$

$\text{Ethanol} = \frac{327 \text{ kcal}}{\text{mole}} * \frac{1 \text{ mole ethanol}}{46.1 \text{ grams}} = 7.09 \frac{\text{kcal}}{\text{gram}} \therefore \text{Better fuel (per gram)}$

5.90 $2 \times 10^{-8} \text{ g} * 0.20 * \frac{1 \text{ mole hem}}{68000 \text{ g}} * \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mole}} = 3.5 \times 10^{10} \text{ molecules } (\approx 35 \text{ billion})$

5.92 $29700 \text{ g N}_2 * \frac{1 \text{ mol N}_2}{28.0 \text{ g}} * \frac{2 \text{ mol NH}_3}{1 \text{ mol N}_2} = 2120 \text{ moles NH}_3$

$3310 \text{ g H}_2 * \frac{1 \text{ mol H}_2}{2.02 \text{ g}} * \frac{2 \text{ mol NH}_3}{3 \text{ mol H}_2} = 1090 \text{ moles NH}_3 \therefore \text{limiting reagent}$

$1090 \text{ moles NH}_3 * \frac{1 \text{ mol N}_2}{2 \text{ mol NH}_3} * \frac{28.0 \text{ g}}{1 \text{ mol N}_2} = 15300 \text{ grams N}_2 \text{ or } 15.3 \text{ kg required, so } 29.7 - 15.3 = 14.4 \text{ kg remains}$

$1090 \text{ moles NH}_3 * \frac{17.0 \text{ g NH}_3}{1 \text{ mole NH}_3} = 18500 \text{ grams or } 18.5 \text{ kg NH}_3 \text{ produced}$