

Unit V. Review Worksheet Answers.

1. a. lithium hydroxide      b. aluminum nitrate      c. lead(II) chloride or plumbous chloride  
 d. sulfur hexafluoride e. calcium hydrogen carbonate or calcium bicarbonate f. dinitrogen pentaoxide
2. a.  $\text{Ca}(\text{ClO}_4)_2$       b.  $(\text{NH}_4)_3\text{PO}_4$       c.  $\text{PCl}_5$       d.  $\text{Al}_2(\text{C}_2\text{O}_4)_3$       e.  $\text{CrPO}_4$       f.  $\text{ClO}_2$       g.  $\text{SnF}_4$       h.  $\text{Sc}_2(\text{SO}_4)_3$
3. a.  $\text{Cu}_{(s)} + 4\text{HNO}_{3(aq)} \rightarrow \text{Cu}(\text{NO}_3)_{2(aq)} + 2\text{NO} + 2\text{H}_2\text{O(l)}$   
 b.  $2\text{MgO}_{(s)} + \text{Si}_{(g)} \rightarrow 2\text{Mg}_{(s)} + \text{SiO}_{2(s)}$   
 c.  $2\text{Al}_{(s)} + 3\text{H}_2\text{SO}_{4(aq)} \rightarrow \text{Al}_2(\text{SO}_4)_{3(aq)} + 3\text{H}_2$   
 d.  $2\text{FeCl}_{2(s)} + \text{Cl}_{2(g)} \rightarrow 2\text{FeCl}_{3(s)}$   
 e.  $2\text{KClO}_{3(s)} \rightarrow 2\text{KCl} + 3\text{O}_2$
4. a.  $\text{Mg} + \text{NiCl}_2 \rightarrow \text{MgCl}_{2(aq)} + \text{Ni}$   
 b.  $\text{PtCl}_{4(s)} \rightarrow \text{Pt}_{(s)} + 2\text{Cl}_2$   
 c.  $\text{H}_{2(g)} + \text{Br}_{2(g)} \rightarrow 2\text{HBr}_{(g)}$   
 d.  $\text{C}_2\text{H}_5\text{OH}_{(l)} + 3\text{O}_{2(g)} \rightarrow 2\text{CO}_{2(g)} + 3\text{H}_2\text{O(l)}$   
 e.  $\text{Ba}_{(s)} + 2\text{H}_2\text{O}_{(l)} \rightarrow \text{Ba}(\text{OH})_{2(s)} + \text{H}_2$   
 f.  $\text{Cr}_2\text{O}_{3(s)} + 3\text{H}_2\text{O}_{(l)} \rightarrow 2\text{Cr}(\text{OH})_{3(s)}$   
 g.  $3\text{Pb}(\text{NO}_3)_{2(aq)} + \text{Al}_2(\text{SO}_4)_{3(aq)} \rightarrow 3\text{PbSO}_4 + 2\text{Al}(\text{NO}_3)_{3(aq)}$   
 h.  $\text{K}_2\text{CO}_{3(s)} + \text{H}_2\text{SO}_{4(aq)} \rightarrow \text{K}_2\text{SO}_4 + \text{CO}_2 + \text{H}_2\text{O}_{(l)}$
5. a. M.E.:  $2\text{Ga}_{(s)} + 6\text{HCl}_{(aq)} \rightarrow 2\text{GaCl}_{3(aq)} + 3\text{H}_2$   
 I.E.:  $2\text{Ga}^0 + 6\text{H}^+ + 6\text{Cl}^- \rightarrow 2\text{Ga}^{+3} + 6\text{Cl}^- + 3\text{H}_2^0$   
 N.I.E.:  $2\text{Ga}^0 + 6\text{H}^+ \rightarrow 2\text{Ga}^{+3} + 3\text{H}_2^0$   
 $\frac{1}{2}$  Reactions: Oxidation:  $2\text{Ga}^0 \rightarrow 2\text{Ga}^{+3} + 6e^-$   
 Reduction:  $6\text{H}^+ + 6e^- \rightarrow 3\text{H}_2^0$
- \*\*This problem is different between in-class handout (March '03) and what is found on the net.
- b. M.E.:  $4\text{Na}_{(s)} + \text{O}_{2(g)} \rightarrow 2\text{Na}_2\text{O}_{(s)}$   
 I.E.:  $4\text{Na}^0 + \text{O}_2^0 \rightarrow 4\text{Na}^{+1} + 2\text{O}^{-2}$   
 N.I.E.:  $4\text{Na}^0 + \text{O}_2^0 \rightarrow 4\text{Na}^{+1} + 2\text{O}^{-2}$   
 $\frac{1}{2}$  Reactions: Oxidation:  $4\text{Na}^0 \rightarrow 4\text{Na}^{+1} + 4e^-$   
 Reduction:  $\text{O}_2^0 + 4e^- \rightarrow 2\text{O}^{-2}$
6. a. 334 g  $\text{C}_4\text{H}_{10}$       b. 0.051 g S (0.074 g Na)c. 16.7 g  $\text{CO}_2$       d.  $1.19 \times 10^{22}$  molecules  $\text{C}_9\text{H}_8\text{O}_4$       e. 60 mol Teflon
7. a. 6.65% Al      b. 35.0% N      c. 36.2% O
8. a.  $\text{CS}_2$       b.  $\text{KH}_2\text{PO}_4$       c.  $\text{CH}_2\text{O}$       d.  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$  (this is a formula for a hydrate)      e. GaP
9. a. EF=  $\text{CH}_3$  MF=  $\text{C}_3\text{H}_6$       b. EF=  $\text{NO}_2$  MF=  $\text{N}_2\text{O}_4$       c. EF=  $\text{C}_4\text{H}_5\text{N}_2\text{O}$  MF=  $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$       d. EF=  $\text{NH}_2\text{Cl}$  MF=  $\text{NH}_2\text{Cl}$
10. a. 2.5 mol Ga      b. 130 g Ga      c. 0.587 g  $\text{GaCl}_3$       d. 9.036 L  $\text{H}_2$       e. 22.6 g  $\text{H}_2$
11. a.  $\text{HNO}_3$  is limiting; 3.0 mol  $\text{H}_2\text{O}$       b.  $\text{HNO}_3$  is limiting; 19.9 g  $\text{KNO}_3$       c. 36.1 g  $\text{K}_2\text{CO}_3$
12. a. 0.4116 mol  $\text{HC}_2\text{H}_3\text{O}_2$       b. 24.7 g  $\text{HC}_2\text{H}_3\text{O}_2$  excess, 32.55 g  $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2$   
 c. 540 g  $\text{HC}_2\text{H}_3\text{O}_2$  limiting;  $2.562 \times 10^{24}$  molecules  $\text{H}_2\text{O}$
13. a. 31%      b. T.Y.= 0.783 g  $\text{O}_2$ ; 92.0%      c. 61.4 g  $\text{Br}_2$  excess; T.Y.= 60.3 g  $\text{C}_6\text{H}_5\text{Br}$ ; 94.0%