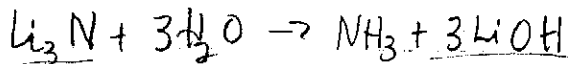


29 poss \geq 20 (+3)

11.2 Practice Problems

①

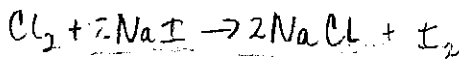


$$M_{\text{LiOH}} = 6.94 + 16.00 + 1.01 = 23.95 \text{ g/mol}$$

$$M_{\text{Li}_3\text{N}} = 3(6.94 \text{ g/mol}) + 14.01 \text{ g/mol} = 34.83 \text{ g/mol}$$

$$\frac{.38 \text{ g Li}_3\text{N}}{1} \cdot \frac{1 \text{ mol Li}_3\text{N}}{34.83 \text{ g Li}_3\text{N}} \cdot \frac{3 \text{ mol LiOH}}{1 \text{ mol Li}_3\text{N}} \cdot \frac{23.95 \text{ g LiOH}}{1 \text{ mol LiOH}} = \boxed{.78 \text{ g LiOH}}$$

②

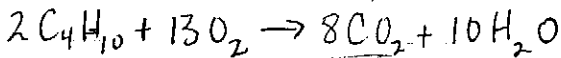


$$M_{\text{NaI}} = 22.99 \text{ g/mol} + 126.90 \text{ g/mol} = 149.81 \text{ g/mol}$$

$$M_{\text{NaCl}} = 22.99 \text{ g/mol} + 35.45 \text{ g/mol} = 58.44 \text{ g/mol}$$

$$\frac{.29 \text{ g NaI}}{1} \cdot \frac{1 \text{ mol NaI}}{149.81 \text{ g NaI}} \cdot \frac{2 \text{ mol NaCl}}{2 \text{ mol NaI}} \cdot \frac{58.44 \text{ g NaCl}}{1 \text{ mol NaCl}} = \boxed{.11 \text{ g NaCl}}$$

③

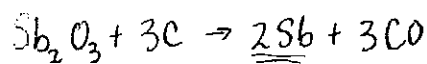


$$M_{\text{C}_4\text{H}_{10}} = 4(12.01 \text{ g/mol}) + 10(1.01 \text{ g/mol}) = 58.14 \text{ g/mol}$$

$$M_{\text{CO}_2} = 12.01 \text{ g/mol} + 2(16.00 \text{ g/mol}) = 44.01 \text{ g/mol}$$

$$\frac{.85 \text{ g C}_4\text{H}_{10}}{1} \cdot \frac{1 \text{ mol C}_4\text{H}_{10}}{58.14 \text{ g C}_4\text{H}_{10}} \cdot \frac{8 \text{ mol CO}_2}{2 \text{ mol C}_4\text{H}_{10}} \cdot \frac{44.01 \text{ g CO}_2}{1 \text{ mol CO}_2} = \boxed{2.6 \text{ g CO}_2}$$

④

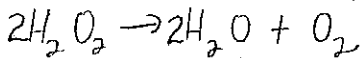


$$M_{\text{Sb}_2\text{O}_3} = 2(121.76) + 3(16.00) = 291.52 \text{ g/mol}$$

$$M_{\text{Sb}} = 121.76 \text{ g/mol}$$

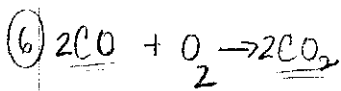
$$\frac{.46 \text{ g Sb}_2\text{O}_3}{1} \cdot \frac{1 \text{ mol Sb}_2\text{O}_3}{291.52 \text{ g Sb}_2\text{O}_3} \cdot \frac{2 \text{ mol Sb}}{1 \text{ mol Sb}_2\text{O}_3} \cdot \frac{121.76 \text{ g Sb}}{1 \text{ mol Sb}} = \boxed{.38 \text{ g Sb}}$$

⑤



$$M_{\text{H}_2\text{O}_2} = 2(1.01) + 2(16.00) = 34.02 \text{ g/mol}$$

$$\frac{.77 \text{ g H}_2\text{O}_2}{1} \cdot \frac{1 \text{ mol H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \cdot \frac{2 \text{ mol H}_2\text{O}}{2 \text{ mol H}_2\text{O}_2} \cdot \frac{34.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}_2} = \boxed{1.5 \text{ g H}_2\text{O}}$$



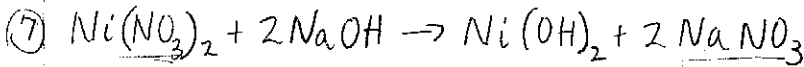
$$M_{\text{CO}} = 12.01 \text{ g/mol} + 16.00 \text{ g/mol} = 28.0$$

$$M_{\text{CO}_2} = 12.01 \text{ g/mol} + 2(16.00 \text{ g/mol}) = 44.01 \text{ g/mol}$$

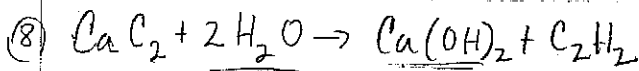
$$\frac{.69 \text{ g CO}_2}{1} \cdot \frac{1 \text{ mol CO}_2}{44.01 \text{ g CO}_2} \cdot \frac{2 \text{ mol CO}}{2 \text{ mol CO}_2} \cdot \frac{28.01 \text{ g CO}}{1 \text{ mol CO}} = \boxed{.44 \text{ g CO}}$$

$$M_{\text{NaNO}_3} = 22.99 + 14.01 + 3(16.00) = 85.00$$

$$M_{\text{Ni(NO}_3)_2} = 58.69 + 2(14.01) + 6(16.00) = 182.71 \text{ g/mol}$$

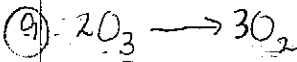


$$\frac{.73 \text{ g Ni(NO}_3)_2}{1} \cdot \frac{1 \text{ mol Ni(NO}_3)_2}{182.71 \text{ g Ni(NO}_3)_2} \cdot \frac{2 \text{ mol NaNO}_3}{1 \text{ mol Ni(NO}_3)_2} \cdot \frac{85.00 \text{ g NaNO}_3}{1 \text{ mol NaNO}_3} = \boxed{.68 \text{ g NaNO}_3}$$



$$M_{\text{Ca(OH)}_2} = 40.08 + 2(16.00) + 2(1.01) = 74.10$$

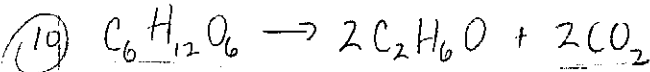
$$\frac{.64 \text{ g H}_2\text{O}}{1} \cdot \frac{1 \text{ mol H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} \cdot \frac{1 \text{ mol Ca(OH)}_2}{2 \text{ mol H}_2\text{O}} \cdot \frac{74.10 \text{ g Ca(OH)}_2}{1 \text{ mol Ca(OH)}_2} = \boxed{1.3 \text{ g Ca(OH)}_2}$$



$$M_{\text{O}_3} = 3(16.00) = 48.00 \text{ g/mol}$$

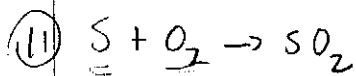
~~$$\frac{.87 \text{ g O}_2}{1} \cdot \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \cdot \frac{3 \text{ mol O}_3}{2 \text{ mol O}_2} \cdot \frac{48.0 \text{ g O}_3}{1 \text{ mol O}_3} = \boxed{.87 \text{ g O}_3}$$~~

$$\frac{.87 \text{ g O}_2}{1} \cdot \frac{1 \text{ mol O}_2}{32.0 \text{ g O}_2} \cdot \frac{2 \text{ mol O}_3}{3 \text{ mol O}_2} \cdot \frac{48.0 \text{ g O}_3}{1 \text{ mol O}_3} = \boxed{.87 \text{ g O}_3}$$

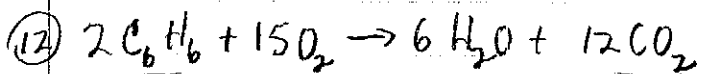


$$M_{\text{C}_6\text{H}_{12}\text{O}_6} = 6(12.01) + 12(1.01) + 6(16.00) = 180.18$$

$$\frac{1.82 \text{ L CO}_2}{1} \cdot \frac{1 \text{ mol CO}_2}{22.4 \text{ L CO}_2} \cdot \frac{1 \text{ mol C}_6\text{H}_{12}\text{O}_6}{2 \text{ mol CO}_2} \cdot \frac{180.18 \text{ g C}_6\text{H}_{12}\text{O}_6}{1 \text{ mol C}_6\text{H}_{12}\text{O}_6} = \boxed{7.32 \text{ g C}_6\text{H}_{12}\text{O}_6}$$



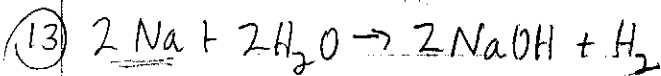
$$\frac{425 \text{ g S}}{1} \cdot \frac{1 \text{ mol S}}{32.07 \text{ g S}} \cdot \frac{1 \text{ mol O}_2}{1 \text{ mol S}} \cdot \frac{22.4 \text{ L O}_2}{1 \text{ mol O}_2} = \boxed{297 \text{ L O}_2}$$



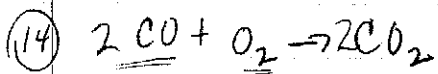
$$M_{\text{C}_6\text{H}_6} = 6(12.01) + 6(1.01) = 78.12 \text{ g}$$

$$\frac{2.66 \text{ L CO}_2}{1} \cdot \frac{1 \text{ mol CO}_2}{22.4 \text{ L CO}_2} \cdot \frac{2 \text{ mol C}_6\text{H}_6}{12 \text{ mol CO}_2} \cdot \frac{78.12 \text{ g C}_6\text{H}_6}{1 \text{ mol C}_6\text{H}_6} = \boxed{1.55 \text{ g C}_6\text{H}_6}$$

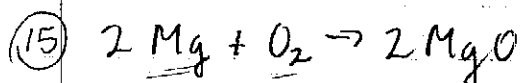
benzene.



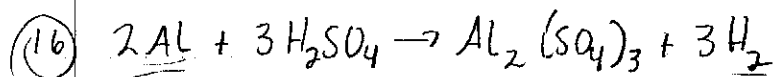
$$\frac{5.68 \text{ L H}_2}{1} \cdot \frac{1 \text{ mol H}_2}{22.4 \text{ L H}_2} \cdot \frac{2 \text{ mol Na}}{1 \text{ mol H}_2} \cdot \frac{22.99 \text{ g Na}}{1 \text{ mol Na}} = \boxed{11.7 \text{ g Na}}$$



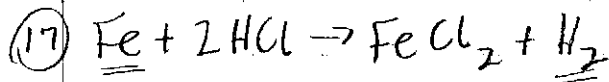
$$\frac{277 \text{ g CO}}{1} \cdot \frac{1 \text{ mol CO}}{28.01 \text{ g CO}} \cdot \frac{1 \text{ mol O}_2}{2 \text{ mol CO}} \cdot \frac{22.4 \text{ L O}_2}{1 \text{ mol O}_2} = \boxed{111 \text{ L O}_2}$$



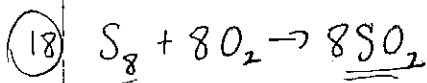
$$\frac{134 \text{ g Mg}}{1} \cdot \frac{1 \text{ mol Mg}}{24.31 \text{ g Mg}} \cdot \frac{1 \text{ mol O}_2}{2 \text{ mol Mg}} \cdot \frac{22.4 \text{ L O}_2}{1 \text{ mol O}_2} = \boxed{61.7 \text{ L O}_2}$$



$$\frac{4.72 \text{ L H}_2}{1} \cdot \frac{1 \text{ mol H}_2}{22.4 \text{ L H}_2} \cdot \frac{2 \text{ mol Al}}{3 \text{ mol H}_2} \cdot \frac{26.98 \text{ g Al}}{1 \text{ mol Al}} = \boxed{3.79 \text{ g Al}}$$

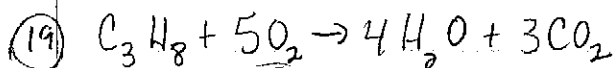


$$\frac{225 \text{ g Fe}}{1} \cdot \frac{1 \text{ mol Fe}}{55.85 \text{ g Fe}} \cdot \frac{1 \text{ mol H}_2}{1 \text{ mol Fe}} \cdot \frac{22.4 \text{ L H}_2}{1 \text{ mol H}_2} = \boxed{90.2 \text{ L H}_2}$$

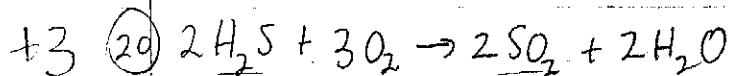


$$M_{\text{S}_8} = 8(32.07) = 256.56$$

$$\frac{2.47 \text{ L SO}_2}{1} \cdot \frac{1 \text{ mol SO}_2}{22.4 \text{ L SO}_2} \cdot \frac{1 \text{ mol S}_8}{8 \text{ mol SO}_2} \cdot \frac{256.56 \text{ g S}_8}{1 \text{ mol S}_8} = \boxed{3.54 \text{ g S}_8}$$



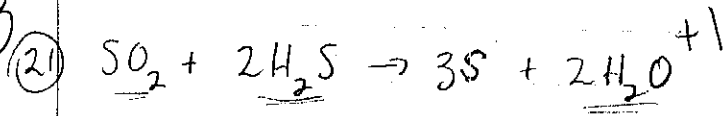
$$\frac{2.8 \text{ L O}_2}{1} \cdot \frac{3 \text{ L CO}_2}{5 \text{ L O}_2} = \boxed{1.7 \text{ L CO}_2}$$



$$\frac{14.2 \text{ L SO}_2}{1} \cdot \frac{2 \text{ L H}_2\text{S}}{2 \text{ L SO}_2} = \boxed{14.2 \text{ L H}_2\text{S}}$$

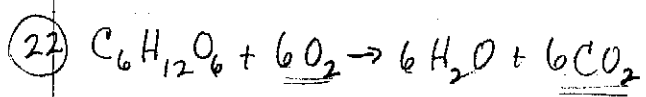
$$\frac{14.2 \text{ L SO}_2}{1} \cdot \frac{3 \text{ L O}_2}{2 \text{ L SO}_2} = \boxed{21.3 \text{ L O}_2}$$

+3



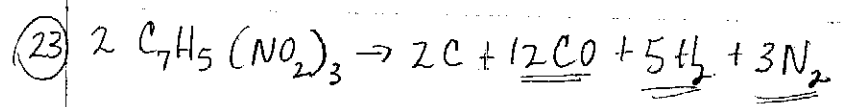
$\frac{11.4 \cancel{L H_2O}}{1} \cdot \frac{1 \cancel{L SO_2}}{2 \cancel{L H_2O}} = \boxed{5.70 \text{ L } SO_2} + 1$

$\frac{11.4 \cancel{L H_2O}}{1} \cdot \frac{2 \cancel{L H_2S}}{2 \cancel{L H_2O}} = \boxed{11.4 \text{ L } H_2S} + 1$



$\frac{3.7 \cancel{L O_2}}{1} \cdot \frac{6 \cancel{L CO_2}}{6 \cancel{L O_2}} = \boxed{3.7 \text{ L } CO_2}$

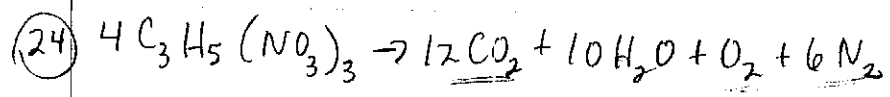
+3



$\frac{5.8 \cancel{L CO}}{1} \cdot \frac{5 \cancel{L H_2}}{12 \cancel{L CO}} = \boxed{2.4 \text{ L } H_2}$

$\frac{5.8 \cancel{L CO}}{1} \cdot \frac{3 \cancel{L N_2}}{12 \cancel{L CO}} = \boxed{1.5 \text{ L } N_2}$

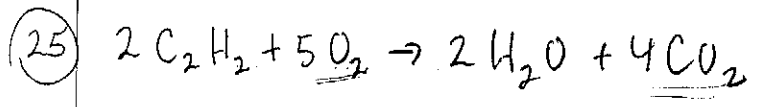
+3



$\frac{4.3 \cancel{L CO_2}}{1} \cdot \frac{1 \cancel{L O_2}}{12 \cancel{L CO_2}} = \boxed{.36 \text{ L } O_2}$

$\frac{4.3 \cancel{L CO_2}}{1} \cdot \frac{6 \cancel{L N_2}}{12 \cancel{L CO_2}} = \boxed{2.2 \text{ L } N_2}$

+2



$\frac{1.6 \cancel{L O_2}}{1} \cdot \frac{4 \cancel{L CO_2}}{5 \cancel{L O_2}} = \boxed{1.3 \text{ L } CO_2}$