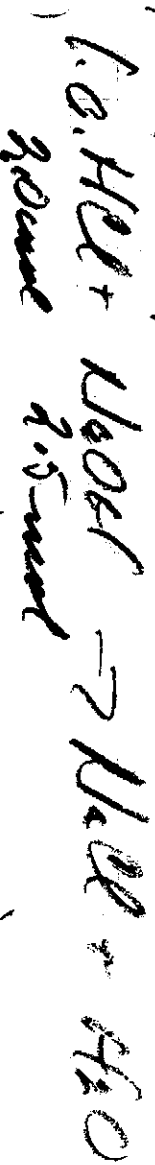


Use H₂O₂ - limiting Reagents



$$\frac{2.0 \text{ mol H}_2\text{O}_2 (1 \text{ mol H}_2\text{O}_2)}{1 \text{ mol H}_2\text{O}_2} = 2.0 \text{ mol H}_2\text{O}_2 \text{ possible}$$

$$\frac{2.5 \text{ mol H}_2\text{O}_2 (1 \text{ mol H}_2\text{O}_2)}{1 \text{ mol H}_2\text{O}_2} = 2.5 \text{ mol H}_2\text{O}_2 \text{ possible}$$

∴ H₂O₂ is limiting



$$\frac{2.5 \text{ mol Zn} (1 \text{ mol ZnCl}_2)}{1 \text{ mol Zn}} = 2.5 \text{ mol ZnCl}_2$$

$$\frac{4.0 \text{ mol HCl} (1 \text{ mol ZnCl}_2)}{2 \text{ mol HCl}} = 2.0 \text{ mol ZnCl}_2$$

∴ HCl is limiting

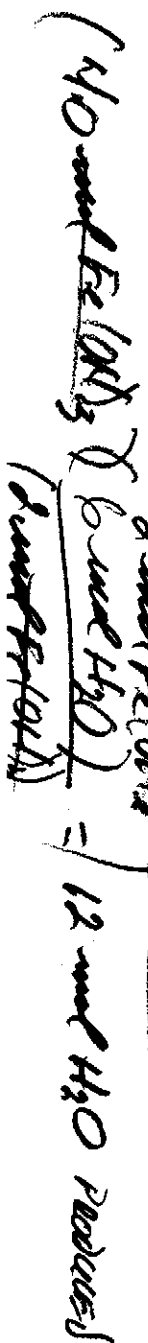
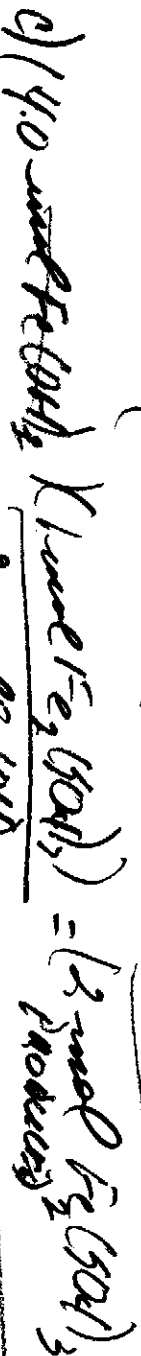
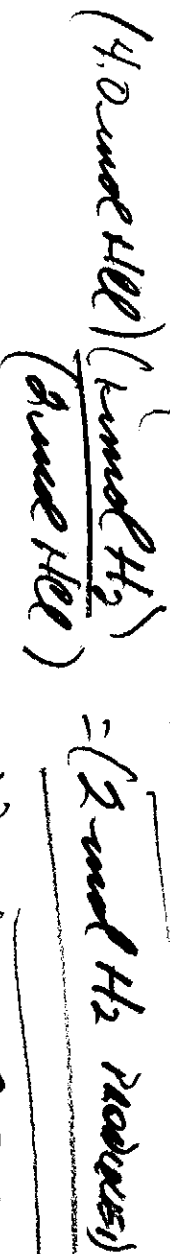
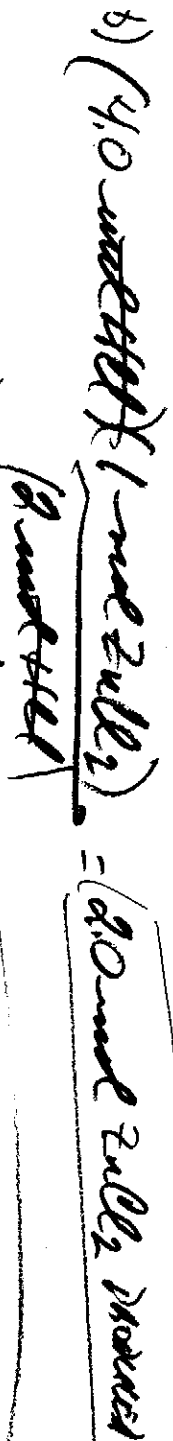
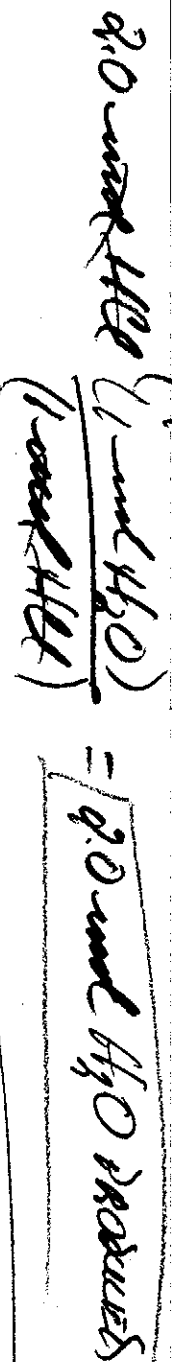
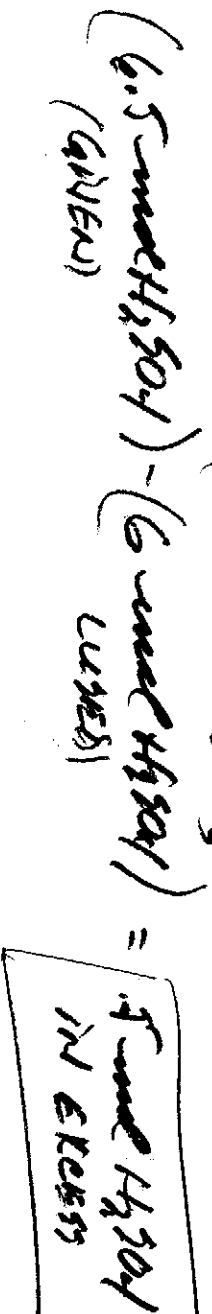
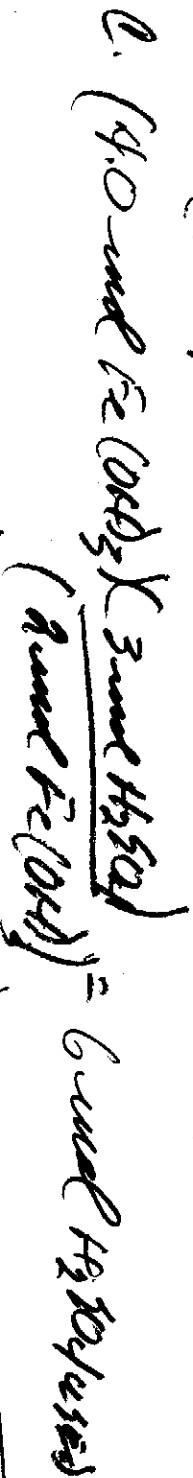
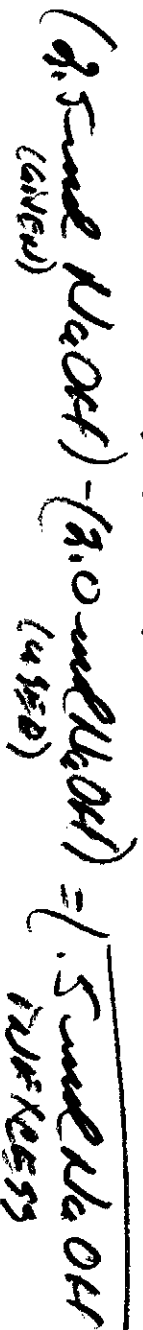
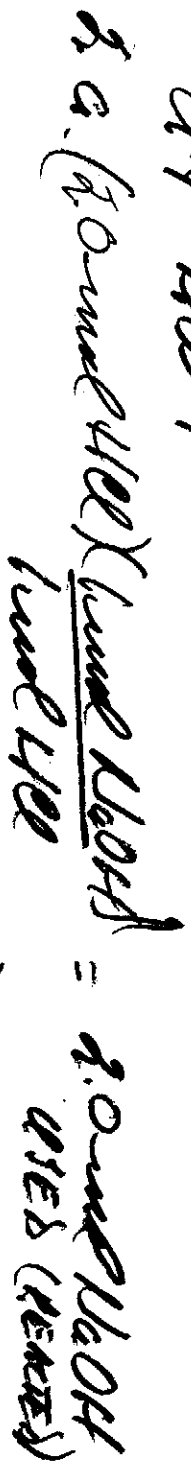


$$\frac{4.0 \text{ mol Fe}(\text{OH})_3 (1 \text{ mol Fe}_2(\text{SO}_4)_3)}{2 \text{ mol Fe}(\text{OH})_3} = 2.0 \text{ mol Fe}_2(\text{SO}_4)_3$$

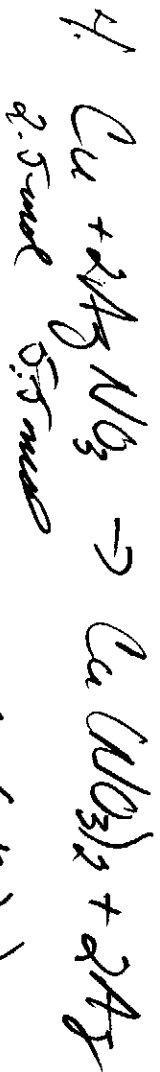
$$\frac{6.5 \text{ mol H}_2\text{SO}_4 (1 \text{ mol Fe}_2(\text{SO}_4)_3)}{3 \text{ mol H}_2\text{SO}_4} = 2.17 \text{ mol Fe}_2(\text{SO}_4)_3$$

∴ Fe(OH)₃ is limiting

4th Work



Q4 HW #4



$$\frac{2.5 \text{ mol AgNO}_3}{1 \text{ mol Cu}} \times \frac{1 \text{ mol Cu}(\text{NO}_3)_2}{2 \text{ mol AgNO}_3} = 2.5 \text{ mol Cu}(\text{NO}_3)_2$$

$$\frac{5.5 \text{ mol AgNO}_3}{2 \text{ mol AgNO}_3} \times \frac{1 \text{ mol Cu}(\text{NO}_3)_2}{2 \text{ mol AgNO}_3} = 2.75 \text{ mol Cu}(\text{NO}_3)_2$$

Cu is limiting reagent

a) $\frac{2.5 \text{ mol Cu}}{1 \text{ mol Cu}} = 5 \text{ mol AgNO}_3$

$$5.5 \text{ mol AgNO}_3 - 5 \text{ mol AgNO}_3 = .5 \text{ mol AgNO}_3 \text{ left over}$$

b) $2.5 \text{ mol Cu} \rightarrow 2.5 \text{ mol Cu}(\text{NO}_3)_2$
 $\rightarrow 5 \text{ mol Ag}$

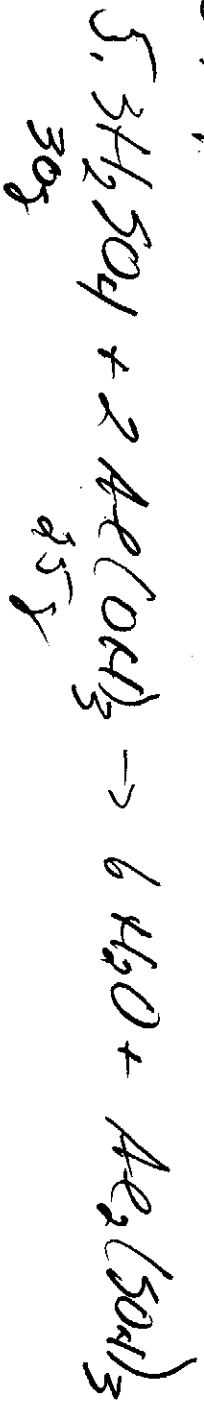
$$\frac{2.5 \text{ mol Cu}(\text{NO}_3)_2}{1 \text{ mol Cu}} \times \frac{187.573}{1} = 468.933 \text{ Cu}(\text{NO}_3)_2$$

$$\frac{5 \text{ mol Ag}}{107.875} = 539.355$$

$$\rightarrow \frac{2.5 \text{ mol Cu}}{1 \text{ mol Cu}} \times \frac{1 \text{ mol Cu}(\text{NO}_3)_2}{1 \text{ mol Cu}} = 2.5 \text{ mol Cu}(\text{NO}_3)_2$$

$$\frac{2.5 \text{ mol Cu}}{1 \text{ mol Cu}} \times \frac{2 \text{ mol Ag}}{1 \text{ mol Cu}} = 5 \text{ mol Ag Formed}$$

K10 #4



$$a) \left(30g H_2SO_4 \right) \left(\frac{1 \text{ mol}}{98.05g} \right) = .306 \text{ mol } H_2SO_4$$

$$\left(85g Al(OH)_3 \right) \left(\frac{1 \text{ mol}}{78.01g} \right) = .320 \text{ mol } Al(OH)_3$$

$$\left(.306 \text{ mol } H_2SO_4 \right) \left(\frac{6 \text{ mol } H_2O}{3 \text{ mol } H_2SO_4} \right) = .612 \text{ mol } H_2O$$

$$\left(.320 \text{ mol } Al(OH)_3 \right) \left(\frac{6 \text{ mol } H_2O}{2 \text{ mol } Al(OH)_3} \right) = .96 \text{ mol } H_2O$$

$\therefore H_2SO_4$ is limiting reagent

$$b) \left(.306 \text{ mol } H_2SO_4 \right) \left(\frac{2 \text{ mol } Al(OH)_3}{3 \text{ mol } H_2SO_4} \right) = .204 \text{ mol } Al(OH)_3 \text{ (consumed)}$$

$.320 \text{ mol } Al(OH)_3 - .204 \text{ mol } Al(OH)_3 = .116 \text{ mol } \text{in excess}$

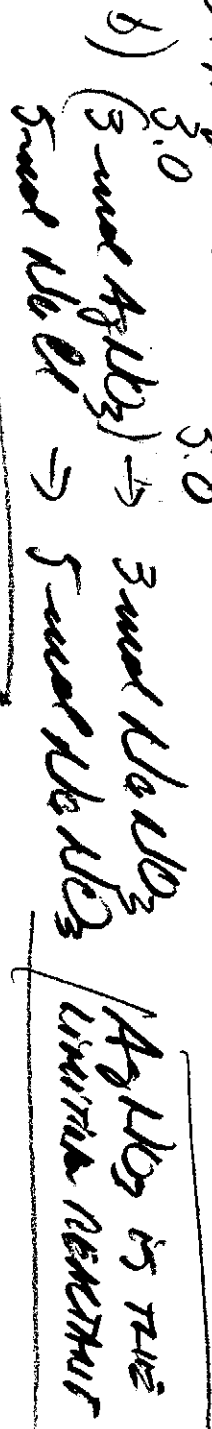
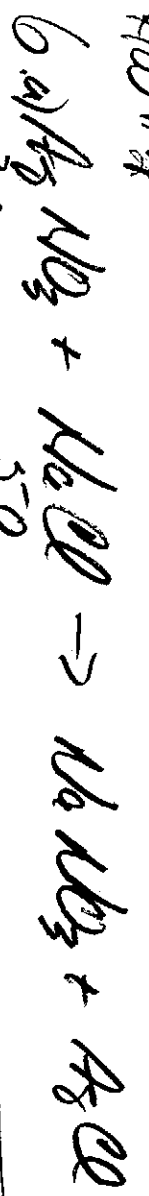
$$\left(.116 \text{ mol } Al(OH)_3 \right) \left(\frac{78.01g}{\text{mol}} \right) = 9.05g \text{ } Al(OH)_3 \text{ in excess}$$

$$c) \left(.612 \text{ mol } H_2O \right) \left(\frac{18.02g}{\text{mol}} \right) = 11.03g \text{ } H_2O \text{ formed}$$

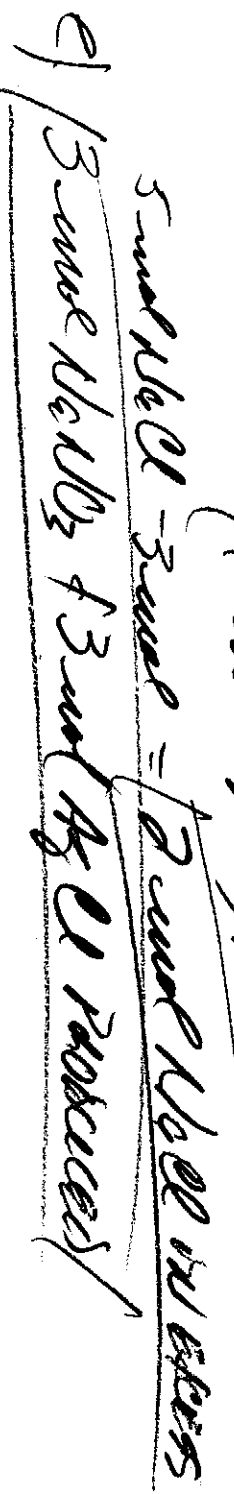
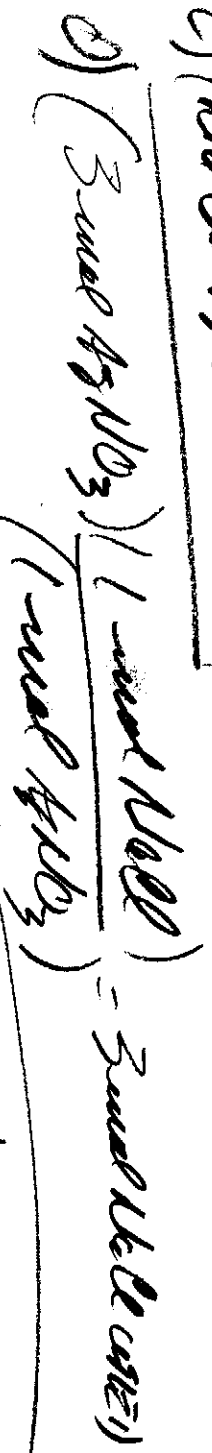
$$\left(.306 \text{ mol } H_2SO_4 \right) \left(\frac{1 \text{ mol } Al_2(SO_4)_3}{3 \text{ mol } H_2SO_4} \right) = .102 \text{ mol } Al_2(SO_4)_3$$

$$\left(.102 \text{ mol } Al_2(SO_4)_3 \right) \left(\frac{342.14g}{\text{mol}} \right) = 34.9g \text{ } Al_2(SO_4)_3 \text{ formed}$$

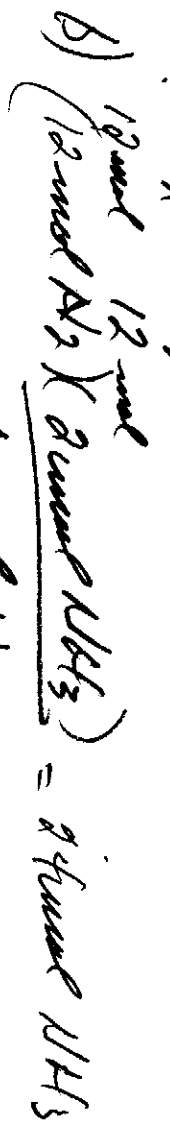
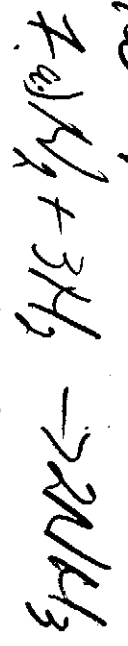
HU #4



c) H_2O is in excess

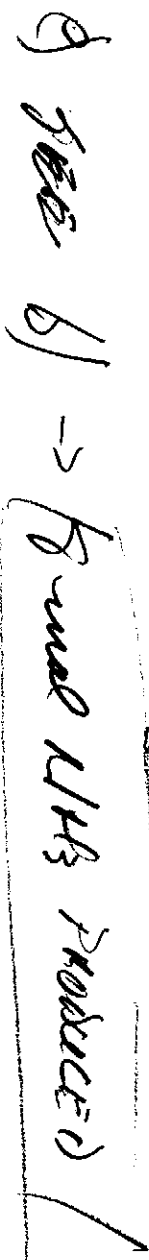
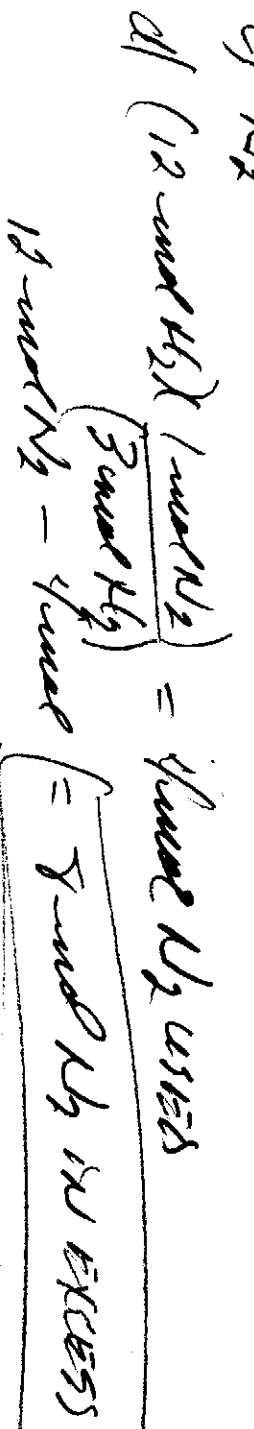


HU #4



H_2 is the limiting reagent

c) N_2 is in excess



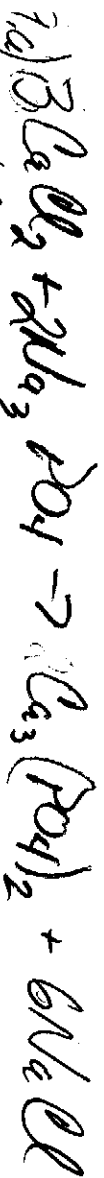
H₂O #H



- b) 10 mol C₃H₈ & unlimited O₂ from atmosphere
 ∴ Yes, C₃H₈ is limiting

$$c) (10 \text{ mol } \text{C}_3\text{H}_8) \times \frac{3 \text{ mol } \text{CO}_2}{1 \text{ mol } \text{C}_3\text{H}_8} = 30 \text{ mol } \text{CO}_2 \text{ produced}$$

$$(10 \text{ mol } \text{C}_3\text{H}_8) \times \frac{4 \text{ mol } \text{H}_2\text{O}}{1 \text{ mol } \text{C}_3\text{H}_8} = 40 \text{ mol } \text{H}_2\text{O} \text{ produced}$$



b) $(100 \text{ g } \text{CaCl}_2) \times \frac{1 \text{ mol } \text{CaCl}_2}{110.98 \text{ g}} = .901 \text{ mol } \text{CaCl}_2$

$$(100 \text{ g } \text{Na}_3\text{PO}_4) \times \frac{1 \text{ mol } \text{Na}_3\text{PO}_4}{163.94 \text{ g}} = .61 \text{ mol } \text{Na}_3\text{PO}_4$$

$$(.901 \text{ mol } \text{CaCl}_2) \times \frac{3 \text{ mol } \text{CaCl}_2}{3 \text{ mol } \text{CaCl}_2} = 3 \text{ mol } \text{Ca}_3(\text{PO}_4)_2$$

$$(.61 \text{ mol } \text{Na}_3\text{PO}_4) \times \frac{1 \text{ mol } \text{Ca}_3(\text{PO}_4)_2}{2 \text{ mol } \text{Na}_3\text{PO}_4} = .305 \text{ mol } \text{Ca}_3(\text{PO}_4)_2$$

∴ CaCl₂ is limiting reagent

a) Na₃PO₄ is in excess

d) $(.901 \text{ mol } \text{CaCl}_2) \times \frac{2 \text{ mol } \text{Na}_3\text{PO}_4}{3 \text{ mol } \text{CaCl}_2} = .6 \text{ mol } \text{Na}_3\text{PO}_4 \text{ used}$

$$.61 - .6 = .01 \text{ mol } \text{Na}_3\text{PO}_4 \text{ LEFT}$$

e) $(.3 \text{ mol } \text{Ca}_3(\text{PO}_4)_2) \times \frac{3(10.15 \text{ g})}{1 \text{ mol}} = 93.05 \text{ g } \text{Ca}_3(\text{PO}_4)_2$

$$(.901 \text{ mol } \text{CaCl}_2) \times \frac{6 \text{ mol } \text{NaCl}}{3 \text{ mol } \text{CaCl}_2} = 1.802 \text{ mol } \text{NaCl}$$

#400 #A

#9 e) continued

$$(1.502 \text{ mol } \text{H}_2\text{O}) \left(\frac{58.14 \text{ g}}{\text{mol}} \right) = 105.31 \text{ g } \text{H}_2\text{O}$$