AP Chem Unit 2 - Wkst Practice Opportunity B

1a. $\left(\frac{5.623\text{ g } NaHCO_3}{1}\right)\left(\frac{1\text{ mole } NaHCO_3}{84.01\text{ g } NaHCO_3}\right)\left(\frac{1}{.2500\text{ L}}\right) = \boxed{.2677\text{ mole/L } NaHCO_3}$

c $\left(\frac{a1025\text{g Cu}}{1}\right)\left(\frac{1\text{ mole Cu}}{63.55\text{g Cu}}\right)\left(\frac{1}{.2000\text{ L}}\right)\left(\frac{1\text{ mole } Cu^{+2}}{1\text{ mole Cu}}\right) = \boxed{0.008065\text{ mole/L } Cu^{+2}}$

2. $\left(\frac{75.0\text{ml } C_2H_5OH}{1}\right)\left(\frac{.79\text{g } C_2H_5OH}{cm^3}\right)\left(\frac{1}{.2500\text{ L}}\right)\left(\frac{1\text{ mole } C_2H_5OH}{46.07\text{ g } C_2H_5OH}\right)$

note: $1\text{ ml} = 1\text{cm}^3$

$\boxed{= 5.1\text{ mole/L } C_2H_5OH}$

3b. $\left(\frac{1.00\text{ g } K_3PO_4}{1}\right)\left(\frac{1\text{ mole } K_3PO_4}{212.27\text{ g } K_3PO_4}\right)\left(\frac{1}{0.2500\text{L}}\right) = 0.0188\text{ mole/L } K_3PO_4$

$[K^+] = 3 \times 0.0188\text{ M } K_3PO_4$ ↳ $\frac{3\text{ mole } K^+}{1\text{ mole } K_3PO_4}$

$\boxed{[K^+] = 0.0564\text{ M}}$

$[PO_4^{-3}] = 1 \times 00188\text{M } K_3PO_4$

$\boxed{[PO_4^{-3}] = 0.0188\text{ M}}$

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5. $\left(\frac{10.\text{g } AgNO_3}{1}\right)\left(\frac{1 \text{ mole } AgNO_3}{169.88 \text{ g } AgNO_3}\right)\left(\frac{1 \text{ L}}{.25 \text{ mole } AgNO_3}\right) = \boxed{0.24 \text{ L}}$

6a. $M_1 = 18 \text{ M } H_2SO_4$ $M_2 = .50 \text{ M } H_2SO_4$

$V_1 = ?$ $V_2 = 1.00 \text{ L}$

$M_1V_1 = M_2V_2$

$(18 \text{ M})V_1 = (.50 \text{ M})(1.00 \text{ L})$

$V_1 = 0.028 \text{ L}$

1. measure 28 ml of 18 M H_2SO_4 into Volumetric FLASK
2. Fill to 1.00 L mark w/ distilled H_2O
3. Stopper & Mix

7. $(NH_4)_2SO_{4(s)} \longrightarrow 2NH^+_{(aq)} + SO_4^{-2}{}_{(aq)}$

$\left(\frac{10.8\text{g } (NH_4)_2SO_4}{1}\right)\left(\frac{1 \text{ mole } (NH_4)_2SO_4}{132.14 \text{ g } (NH_4)_2SO_4}\right)\left(\frac{1}{0.0000 \text{ L}}\right) = .817 \text{ M } (NH_4)_2SO_4$

Stock original

$M_1 = .817 \text{ M } (NH_4)_2SO_4$ $M_2 = ?$

$V_1 = 10.00 \text{ ml}$ $V_2 = 60.00 \text{ ml}$ (10.00 ml + 50.00 ml)

$M_1V_1 = M_2V_2$

$M_2 = \frac{M_1V_1}{V_2} = \frac{(.817 \text{ M})(10.00 \text{ ml})}{60.00 \text{ ml}}$

$M_2 = 0.136 \text{ M } (NH_4)_2SO_4$ dilute stock

$\frac{1 \text{ mole } SO_4^-}{1 \text{ mole } (NH_4)_2SO_4}$ $[SO_4^-] = 1 \times 0.136 \text{ M} = \boxed{0.136 \text{ M } [SO_4^-]}$

$\frac{2 \text{ mole } NH_4^+}{1 \text{ mole } (NH_4)_2SO_4}$ $[NH_4^+] = 2 \times 0.136 \text{ M} = \boxed{.272 \text{ M } [NH_4^+]}$

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10) $\left(\frac{0.2000 \text{ moles } KIO_3}{1L}\right)\left(\frac{1.000L}{1}\right)\left(\frac{214.0 \text{ g } KIO_3}{1 \text{ mole } KIO_3}\right) = 42.80 \text{g } KIO_3$

Equip: 1.000L Volumetric Flask, Scoopula, Balance w/ 0.00g Capacity,

1. Use Balance to measure 42.80g KIO_3
2. Place in Volumetric Flask, Add enough Distilled H_2O to dissolve
3. Fill Flask to 1.000L mark
4. Stopper & Mix