

SHOW ALL WORK TO RECEIVE CREDIT.

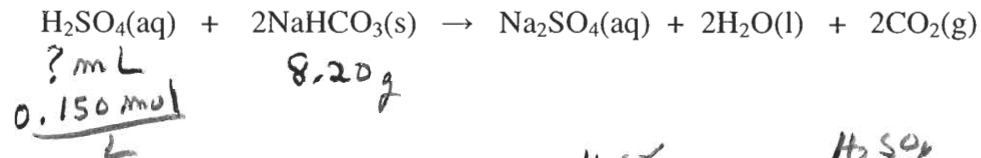
Atomic masses: H 1.008, C 12.01, Na 22.99, P 30.97, S 32.07, O 16.00, K 39.01, As 74.92

1. (8 Pts) Determine the molarity of an H₃AsO₄ (arsenic acid) solution if it took 43.25 mL of 0.223 M NaOH solution to neutralize 25.00 mL of the H₃AsO₄ solution. (First complete and balance the reaction)

$$\begin{array}{c}
 \underline{3} \text{ NaOH(aq)} + \text{H}_3\text{AsO}_4\text{(aq)} \rightarrow 3\text{H}_2\text{O(l)} + \text{Na}_3\text{AsO}_4\text{(aq)} \\
 \begin{array}{l} 43.25 \text{ mL} \\ 0.223 \text{ mol/L} \end{array} \quad \begin{array}{l} 25.00 \text{ mL} \\ \text{NaOH} \end{array}
 \end{array}$$

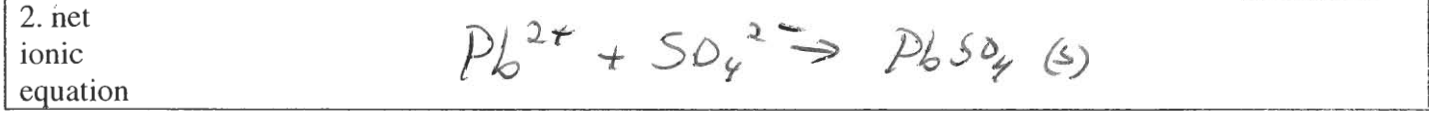
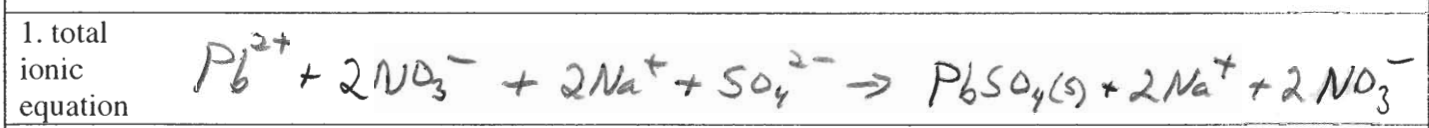
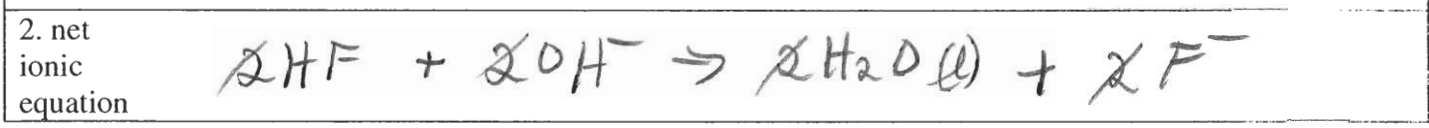
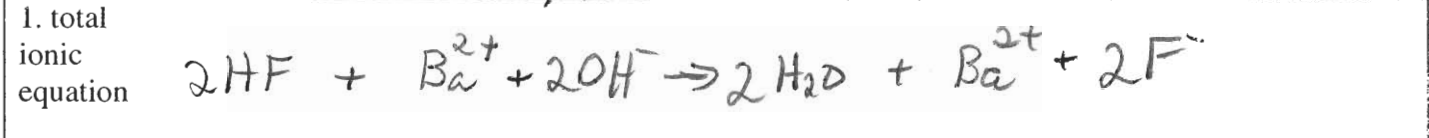
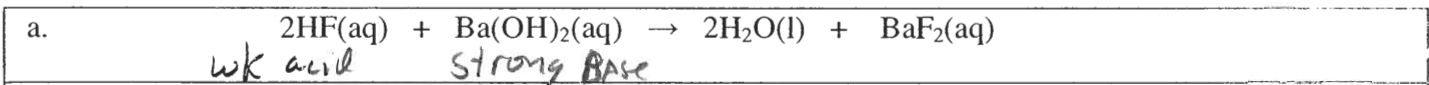
$$\begin{array}{c}
 \begin{array}{l} 43.25 \times 10^{-3} \text{ L} \\ \text{NaOH} \end{array} \quad \begin{array}{l} 0.223 \text{ mol} \\ \text{NaOH} \end{array} \quad \begin{array}{l} 1 \text{ mol H}_3\text{AsO}_4 \\ 3 \text{ mol NaOH} \end{array} = \begin{array}{l} \text{H}_3\text{AsO}_4 \\ 0.129 \text{ mol} \\ \text{L H}_3\text{AsO}_4 \end{array}
 \end{array}$$

2. (6 Pts) How many milliliters of 0.150 M H₂SO₄ are required to react with 8.20 g of NaHCO₃



$$\begin{array}{c}
 8.20 \text{ g NaHCO}_3 \quad \begin{array}{l} \text{mol NaHCO}_3 \\ 84.00 \text{ g} \\ \text{NaHCO}_3 \end{array} \quad \begin{array}{l} 1 \text{ mol H}_2\text{SO}_4 \\ 2 \text{ mol NaHCO}_3 \end{array} \quad \begin{array}{l} 1000 \text{ mL} \\ 0.150 \text{ mol H}_2\text{SO}_4 \end{array} = 325 \text{ mL H}_2\text{SO}_4
 \end{array}$$

3. (8 Pts) Write the total ionic and net ionic equations for each of the following.



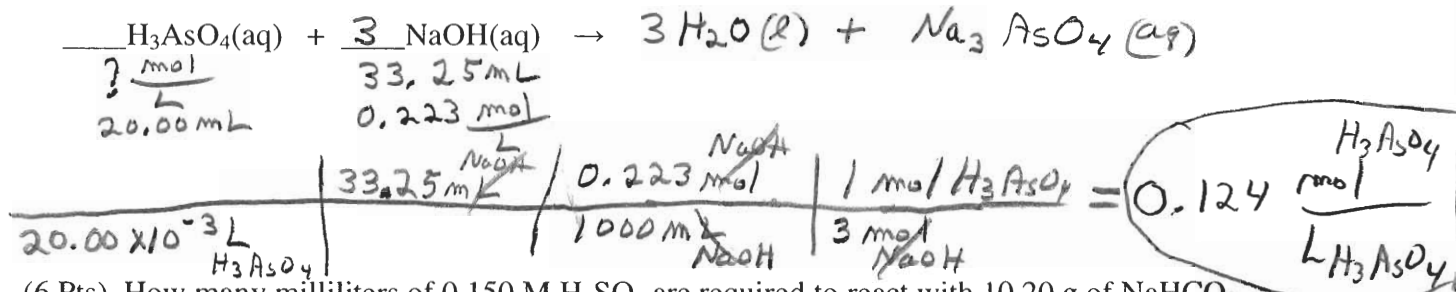
4. (3 Pts) How many mL of 2.00 M nitric acid must be used prepare 500 mL of 0.250 M nitric acid solution?

$$M_1 V_1 = M_2 V_2 \quad V_2 = \frac{M_1 V_1}{M_2} = \frac{(0.250 \text{ M})(500 \text{ mL})}{(2.00 \text{ M})} = 62.5 \text{ mL}$$

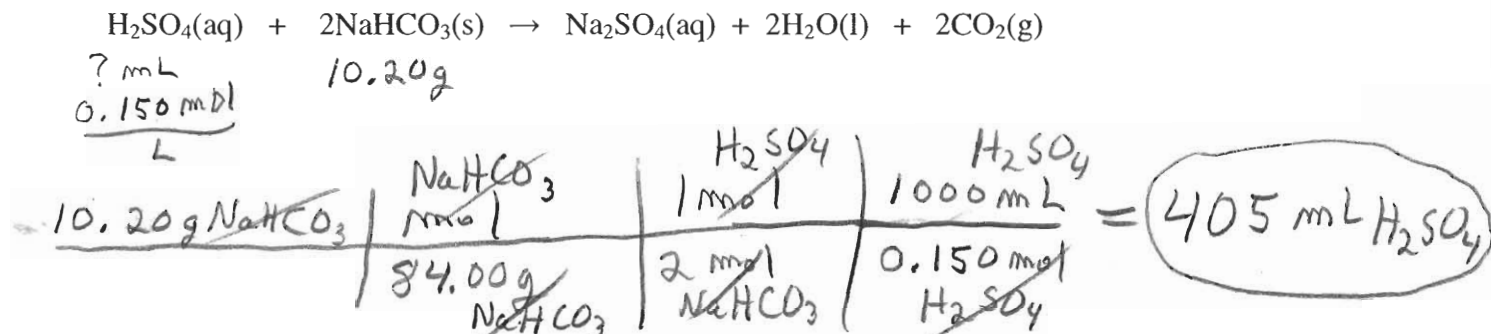
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Atomic masses: H 1.008, C 12.01, Na 22.99, P 30.97, S 32.07, O 16.00, K 39.01, As 74.92

1. (8 Pts) Determine the molarity of an H_3AsO_4 (arsenic acid) solution if it took 33.25 mL of 0.223 M NaOH solution to neutralize 20.00 mL of the H_3AsO_4 solution. (First complete and balance the reaction)



2. (6 Pts) How many milliliters of 0.150 M H_2SO_4 are required to react with 10.20 g of $NaHCO_3$



3. (8 Pts) Write the total ionic and net ionic equations for each of the following.

a.	$Ba(OH)_2(aq) + 2HF(aq) \rightarrow BaF_2(aq) + 2H_2O(l)$ St. Base wk Acid
1. total ionic equation	$Ba^{2+} + 2OH^- + 2HF \rightarrow Ba^{2+} + 2F^- + 2H_2O(l)$
2. net ionic equation	$2OH^- + 2HF \rightarrow 2F^- + 2H_2O(l)$
b.	$Pb(NO_3)_2(aq) + K_2SO_4(aq) \rightarrow PbSO_4(s) + 2KNO_3(aq)$
1. total ionic equation	$Pb^{2+} + 2NO_3^- + 2K^+ + SO_4^{2-} \rightarrow PbSO_4(s) + 2K^+ + 2NO_3^-$
2. net ionic equation	$Pb^{2+} + SO_4^{2-} \rightarrow PbSO_4(s)$

4. (3 Pts) How many mL of 2.00 M nitric acid must be used prepare 500 mL of 0.250 M nitric acid solution?

$$M_1 V_1 = M_2 V_2 \quad V_2 = \frac{M_1 V_1}{M_2} = \frac{(0.250 \text{ M})(500 \text{ mL})}{2.00 \text{ M}} = 62.5 \text{ mL}$$