

Show all work to receive credit.

1. (4 Pts) If 245 grams of potassium nitrate were added to water to make 1,500 mL of solution. What would the molarity of the resulting solution be?

$$\frac{245 \text{ g KNO}_3}{101.02 \text{ g/mol}} \times \frac{1 \text{ mol}}{1.500 \text{ L}} = 1.67 \frac{\text{mol KNO}_3}{\text{L}} \text{ or M}$$

2. (2 Pts) What volume of concentrated nitric acid (15.0 M) is required to make 200. mL of a 4.0 M nitric acid solution?

$$M_1 V_1 = M_2 V_2$$

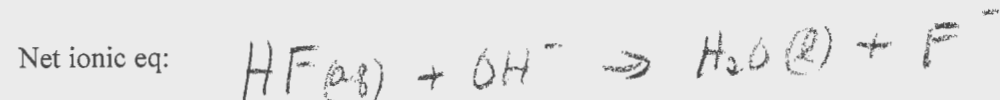
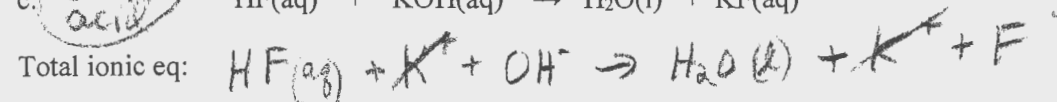
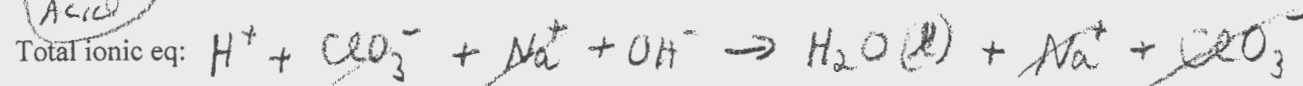
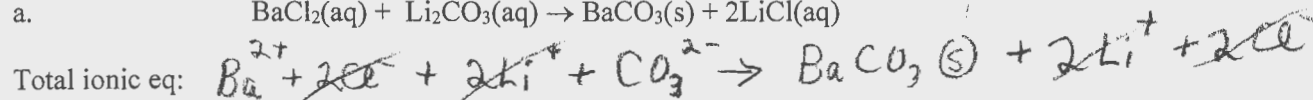
$$(15.0 \text{ M})(V_1) = (4.0 \text{ M})(200 \text{ mL})$$

$$V_1 = 53.3 \text{ mL}$$

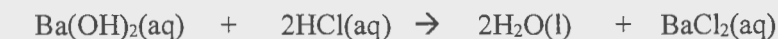
3. (3 Pts) Determine the oxidation number of each of the elements in $\text{Cs}_2\text{Cr}_2\text{O}_7$?



4. (12 Pts) Write the balanced molecular total ionic and net ionic equations for the following reactions. If no reaction is expected, write "no reaction."



5. (4 Pts) Determine the molarity of a barium hydroxide solution if it required 53.85 mL of 0.1525 M hydrochloric acid to neutralize 25.00 mL of the barium hydroxide solution in a titration.



$$\begin{array}{l} 25.00 \text{ mL} \\ ? \text{ mol} \\ \text{L} \end{array} \quad \begin{array}{l} 53.85 \text{ mL} \\ 0.1525 \text{ mol/L} \\ \text{L} \end{array}$$

$$\frac{25.00 \times 10^{-3} \text{ L Ba}(\text{OH})_2}{53.85 \text{ mL HCl} \times \frac{0.1525 \text{ mol HCl}}{1000 \text{ mL HCl}} \times \frac{1 \text{ mol Ba}(\text{OH})_2}{2 \text{ mol HCl}}} = 0.1641 \frac{\text{mol Ba}(\text{OH})_2}{\text{L Ba}(\text{OH})_2}$$

Show all work to receive credit.

1. (4 Pts) If 145 grams of potassium nitrate were added to water to make 1,500 mL of solution. What would the molarity of the resulting solution be?

$$\frac{145 \text{ g KNO}_3}{101.02 \text{ g/mol}} \div \frac{1.500 \text{ L}}{1} = 0.957 \frac{\text{mol}}{\text{L}} \text{ or } M$$

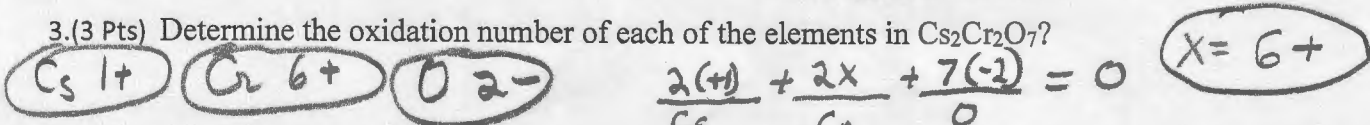
2. (2 Pts) What volume of concentrated nitric acid (15.0 M) is required to make 100. mL of a 3.0 M nitric acid solution?

$$M_1 V_1 = M_2 V_2$$

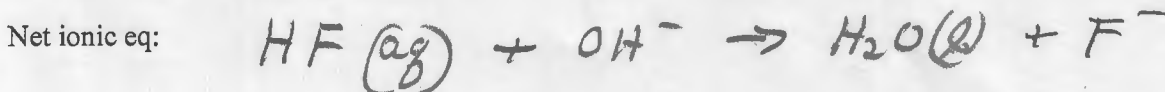
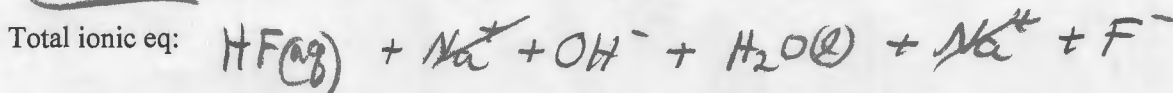
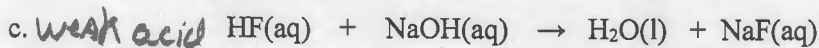
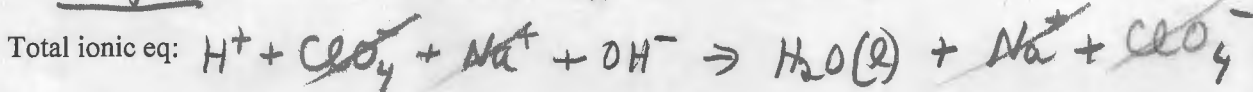
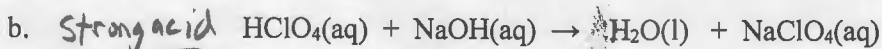
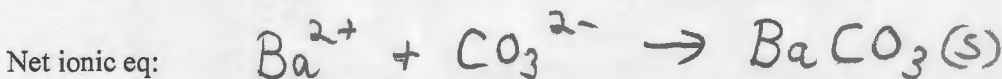
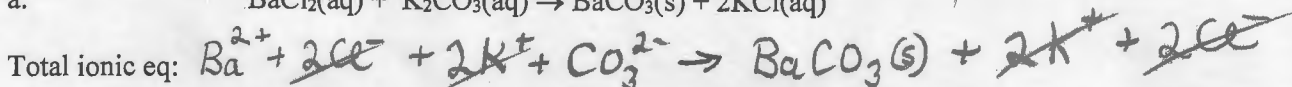
$$(15.0 M)(V_1) = (3.0 M)(100 \text{ mL})$$

$$V_1 = 20 \text{ mL}$$

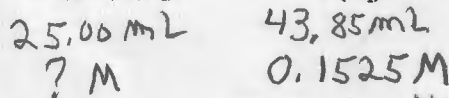
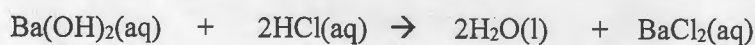
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$$\frac{25.00 \times 10^{-3} \text{ L Ba}(\text{OH})_2}{1} \div \frac{43.85 \text{ mL HCl}}{1000 \text{ mL HCl}} \times \frac{0.1525 \text{ mol HCl}}{1 \text{ mol Ba}(\text{OH})_2} = 0.1337 \frac{\text{mol}}{\text{L Ba}(\text{OH})_2}$$