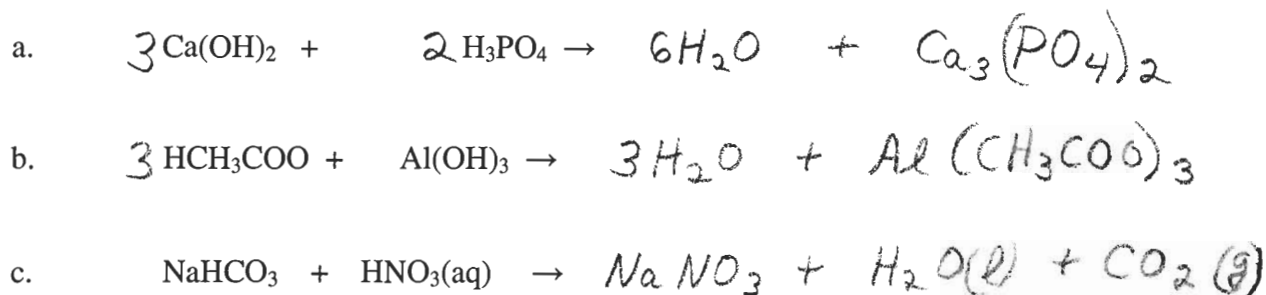
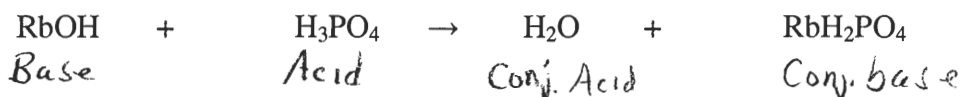


\*\*\*\*SHOW ALL WORK TO RECEIVE CREDIT\*\*\*\*

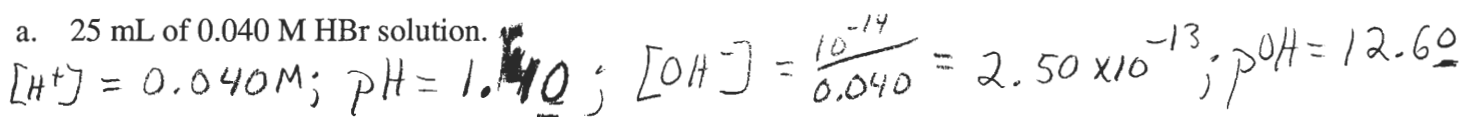
1. (6 Pts) Complete and balance each of the following reactions:



2. (4 Pts) In the following reaction, identify the acid, base, conjugate acid, and the conjugate base.



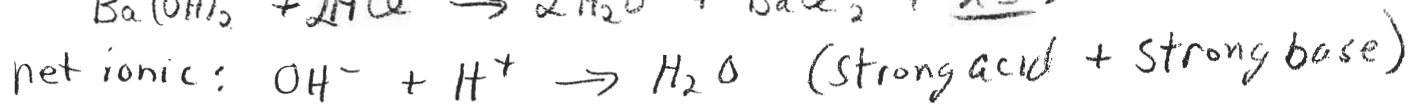
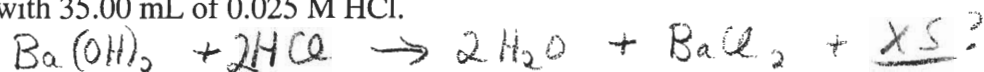
3. (8 Pts) Determine the  $[\text{H}^+]$ ,  $[\text{OH}^-]$ , pH and the pOH of each of the following:



b. 50.0 mL of 0.035 M  $\text{Ba}(\text{OH})_2$  solution.

$$[\text{OH}^-] = 0.070\text{M}; \text{pOH} = 1.15; [\text{H}^+] = 1.43 \times 10^{-13}; \text{pH} = 12.85$$

4. (7 Pts) Determine the pH of a solution formed by combining 35.00 mL of 0.022 M  $\text{Ba}(\text{OH})_2$  solution with 35.00 mL of 0.025 M HCl.



(1) mole acid:  $\frac{35.00 \text{ mL} \times 0.025 \text{ mol HCl}}{1000 \text{ mL}} \times \frac{1 \text{ mol H}^+}{1 \text{ mol HCl}} = 8.75 \times 10^{-4} \text{ mol H}^+$

(2) mol  $\text{OH}^-$ :  $\frac{35.00 \text{ mL} \times 0.022 \text{ mol Ba}(\text{OH})_2}{1000 \text{ mL}} \times \frac{2 \text{ mol OH}^-}{1 \text{ mol Ba}(\text{OH})_2} = 1.54 \times 10^{-3} \text{ mol OH}^-$

(3) subtract for XS =  $6.65 \times 10^{-4} \text{ mol XS OH}^-$

(4)  $\text{pOH} = -\text{Log}\left(\frac{6.65 \times 10^{-4}}{0.070 \text{ L}}\right) = 2.02$

$$\text{pH} = 14 - 2.02 = \underline{\underline{11.98}}$$