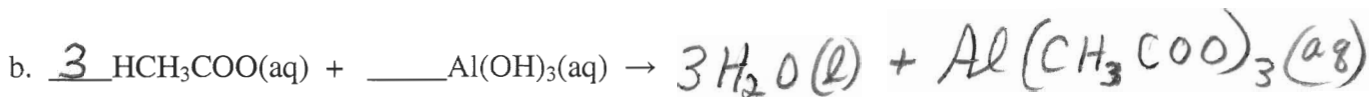
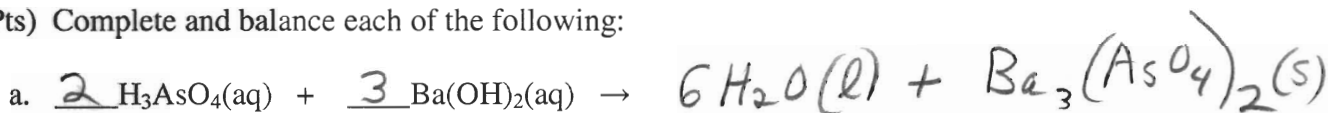


1. (9 Pts) Fill in the missing parts of the table below.

pH	pOH	[H <sub>3</sub> O <sup>+</sup> ]	[OH <sup>-</sup> ]
2.34	11.66	4.57 × 10 <sup>-3</sup>	2.19 × 10 <sup>-12</sup>
3.82	10.18	1.5 × 10 <sup>-4</sup>	6.67 × 10 <sup>-11</sup>
10.57	3.43	2.70 × 10 <sup>-11</sup>	3.7 × 10 <sup>-4</sup>

2. (4 Pts) Complete and balance each of the following:



3. (4 Pts) Determine the pH 50.0 mL of 0.050 M Ba(OH)<sub>2</sub>.

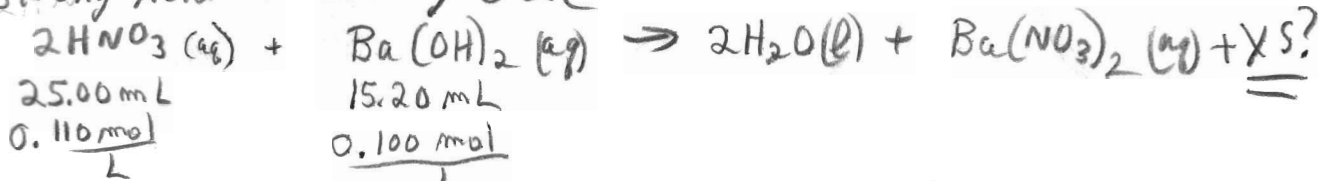
$$2 \times 0.050 = 0.100 \text{ M OH}^-$$

$$\text{pOH} = -\text{Log } 0.100 = 1.00$$

$$\text{pOH} = 13.00$$

4. (8 Pts) A solution is prepared by mixing 25.00 mL of 0.110 M HNO<sub>3</sub> with 15.20 mL of 0.100 M Ba(OH)<sub>2</sub>. Determine the pH and pOH of the resulting solution. Be sure to start with a balanced equation and to show all work.

Strong Acid + Strong Base



Net ionic Eq: H<sup>+</sup> + OH<sup>-</sup> → H<sub>2</sub>O      1:1 ratio

① moles H<sup>+</sup>  $\frac{25.00 \text{ mL} \times 0.110 \text{ mol/L}}{1000 \text{ mL}} = 0.00275 \text{ mol H}^+$

② moles OH<sup>-</sup>  $\frac{15.20 \text{ mL} \times 0.100 \text{ mol Ba}(\text{OH})_2}{1000 \text{ mL}} \times \frac{2 \text{ mol OH}^-}{1 \text{ mol Ba}(\text{OH})_2} = 0.00304 \text{ mol OH}^-$

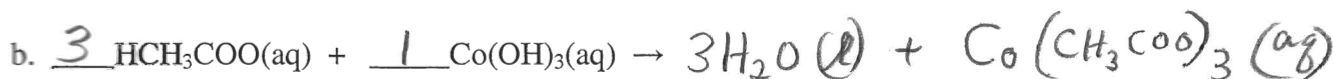
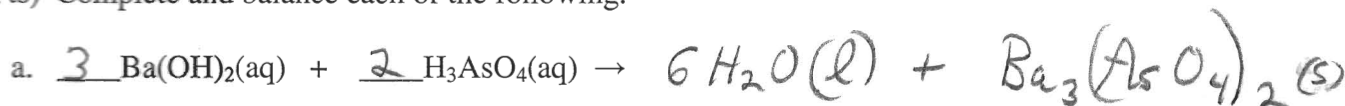
$\text{pOH} = -\text{Log } \frac{2.90 \times 10^{-4} \text{ (mol OH}^-)}{40.2 \times 10^{-3} \text{ (L)}} = 2.142$

$\text{pH} = 11.858$

1. (9 Pts) Fill in the missing parts of the table below.

pH	pOH	[H <sub>3</sub> O <sup>+</sup> ]	[OH <sup>-</sup> ]
3.64	10.36	2.29 × 10 <sup>-4</sup>	4.37 × 10 <sup>-11</sup>
4.60	9.40	2.5 × 10 <sup>-5</sup>	4.0 × 10 <sup>-10</sup>
11.67	2.33	2.13 × 10 <sup>-12</sup>	4.7 × 10 <sup>-3</sup>

2. (4 Pts) Complete and balance each of the following:



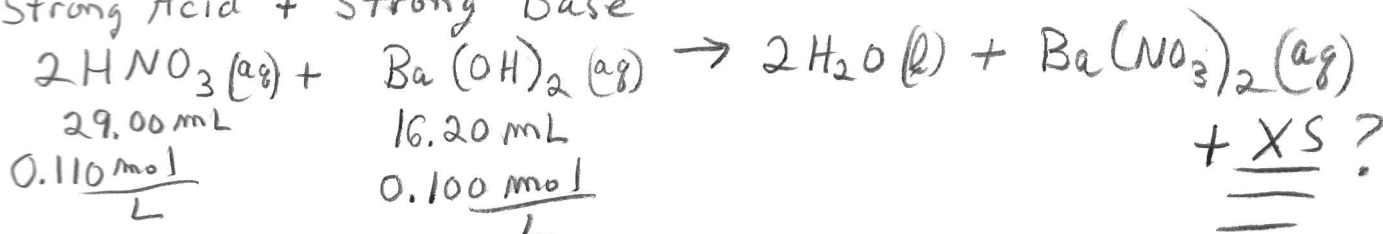
3. (4 Pts) Determine the pH 50.0 mL of 0.060 M Ba(OH)<sub>2</sub>.

$$0.120 \text{ M OH}^-$$

$$\text{pOH} = -\text{Log} = 0.92 \quad \text{pH} = 13.08$$

4. (8 Pts) A solution is prepared by mixing 29.00 mL of 0.110 M HNO<sub>3</sub> with 16.20 mL of 0.100 M Ba(OH)<sub>2</sub>. Determine the pH and pOH of the resulting solution. Be sure to start with a balanced equation and to show all work.

Strong Acid + Strong Base



Net ionic Eq  $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$  1:1 ratio

① moles H<sup>+</sup>:  $\frac{29.00 \text{ mL} \times 0.110 \text{ mol/L}}{1000 \text{ mL}} = 0.00319 \text{ mol H}^+$

② moles OH<sup>-</sup>:  $\frac{16.20 \text{ mL} \times 0.100 \text{ mol/L} \times 2 \text{ mol OH}^-}{1000 \text{ mL} \times 1 \text{ mol OH}^-} = 0.00324 \text{ mol OH}^-$

POH = -Log  $\frac{5.00 \times 10^{-5} \text{ (mol OH)}}{45.2 \times 10^{-3} \text{ L}}$  = 2.956 pH = 11.044