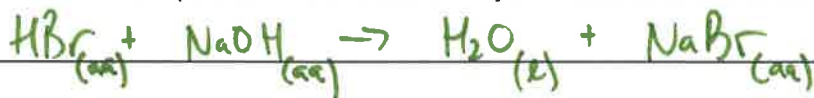


Acid Base Titration Practice

Name: KEY

1) Write the balanced equation for the reaction of hydrobromic acid and sodium hydroxide:



Look at the data table below:

vol HBr	23.5 mL	0.0235 L
vol NaOH	10.7 mL	0.0107 L
M HBr	0.500 M	
M NaOH	? M	

2) Convert the mL of HBr and NaOH to L and fill them into the data table.

3) Calculate the moles of HBr that reacted.

$$\text{mol} = \frac{0.500 \text{ mol}}{1} \cdot 0.0235 \text{ L}$$

0.0118 mol HBr

4) Use the mole ratio to find out how many moles of NaOH reacted.

$$0.0118 \text{ mol HBr} \left(\frac{1 \text{ mol NaOH}}{1 \text{ mol HBr}} \right)$$

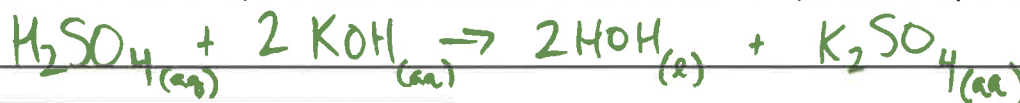
0.0118 mol NaOH

5) Find the molarity of the NaOH. Show work and units!

$$M = \frac{0.0118 \text{ mol NaOH}}{0.0107 \text{ L NaOH}} = 1.10 \frac{\text{mol}}{\text{L}}$$

1.10 M NaOH

6) Write the balanced equation for the reaction of sulfuric acid and potassium hydroxide:



vol H ₂ SO ₄	17.6 mL	0.0176 L
vol KOH	32.8 mL	0.0328 L
M H ₂ SO ₄	? M	
M KOH	1.35 M	

7) Look at the data above. Which substance should you begin your calculations with? KOH

8) Convert the mL of acid and base above to L and fill them into the data table.

9) Calculate the moles of the KOH that reacted, using the data in the table.

$$\frac{1.35 \text{ mol}}{1} \cdot 0.0328 \text{ L}$$

0.0443 mol KOH

10) Use the mole ratio in the equation to find out how many moles of H₂SO₄ you reacted against the KOH.

$$0.0443 \text{ mol KOH} \left(\frac{1 \text{ mol H}_2\text{SO}_4}{2 \text{ mol KOH}} \right)$$

0.0221 mol H₂SO₄

11) Find the molarity of the H₂SO₄ by using the formula M = moles/L. Show work.

$$M = \frac{0.0221 \text{ mol H}_2\text{SO}_4}{0.0176 \text{ L H}_2\text{SO}_4}$$

1.26 M H₂SO₄

13) Write the balanced equation for the reaction of acetic acid (CH₃COOH) and potassium hydroxide (KOH).



vol CH ₃ COOH	10.5 mL	0.0105 L
vol KOH	9.7 mL	0.0097 L
M CH ₃ COOH	? M	
M KOH	1.00 M	

Use the above information and combining all the previous steps into one large problem, find the molarity (M) of the acetic acid solution. Show all your work below.

$$\textcircled{1} \text{ Mol KOH} = \frac{1.00 \text{ mol}}{\text{L}} \cdot 0.0097 \text{ L} = 0.0097 \text{ mol KOH} \quad \underline{0.92} \text{ M}_{\text{CH}_3\text{COOH}}$$

$$\textcircled{2} \text{ mole ratio: } 0.0097 \text{ mol KOH} \left(\frac{1 \text{ mol CH}_3\text{COOH}}{1 \text{ mol KOH}} \right) = 0.0097 \text{ mol CH}_3\text{COOH}$$

$$\textcircled{3} \text{ M}_{\text{CH}_3\text{COOH}} = \frac{0.0097 \text{ mol CH}_3\text{COOH}}{0.0105 \text{ L}} = 0.92 \text{ M}$$

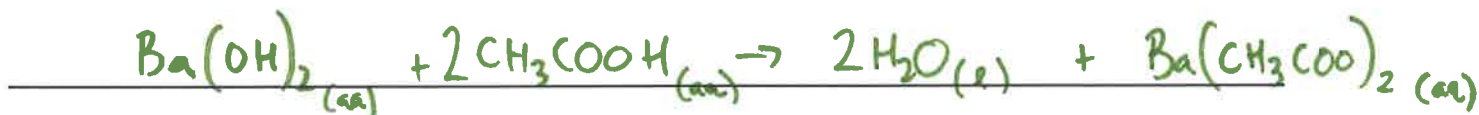
Review: Complete this naming chart:

Name	Formula
sulfuric acid	H ₂ SO ₄
phosphoric acid	H ₃ PO ₄
nitric acid	HNO ₃
nitrous acid	HNO ₂
acetic acid	CH ₃ COOH
methanoic acid	HCOOH
hydrofluoric acid	HF

(aka formic acid)

Complete and balance these neutralization reactions:

a) barium hydroxide + acetic acid:



b) phosphoric acid + sodium hydroxide:

