

Name: \_\_\_\_\_

Chemistry 30

## Unit 5: Acids & Bases

### Assignment 3 – Neutralization and Titration

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1. The substances listed in the chart below were tested with indicators methyl red, phenol red, and thymol blue. Complete the chart indicating what colors would be seen with each indicator.

	<b>methyl red</b>	<b>phenol red</b>	<b>thymol blue</b>
<b>acid rain (pH = 6.3)</b>			
<b>ammonia water (pH = 11.2)</b>			

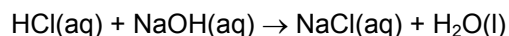
2. Write **balanced** neutralization reactions for the following:

a. the reaction between hydrobromic acid, HBr, and potassium hydroxide, KOH.

b. the reaction between nitric acid, HNO<sub>3</sub> and magnesium hydroxide, Mg(OH)<sub>2</sub>

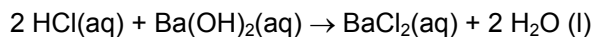
c. the reaction between phosphoric acid, H<sub>3</sub>PO<sub>4</sub> and sodium hydroxide, NaOH

3. What is the molarity of a 25 mL solution of HCl that is titrated to an end point by 10 mL of a 0.200 M solution of NaOH?

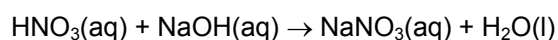


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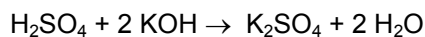
4. What is the molar concentration of a 50-mL solution of  $\text{Ba}(\text{OH})_2$  that is titrated to an end point by 15 mL of a 0.00300 M solution of HCl?



5. What is the molarity of a 21 mL nitric acid solution that completely neutralizes 25.0 mL of a 0.300 M solution of NaOH?



6. What is the molar concentration of a 45.0 mL solution of KOH that is completely neutralized by 15.0 mL of a 0.500 M  $\text{H}_2\text{SO}_4$  solution?



7. A neutral solution is produced when 42.00 mL of a 0.150 M NaOH solution is used to titrate 50.00 mL of a sulfuric acid ( $\text{H}_2\text{SO}_4$ ) solution. What is the concentration of the sulfuric acid solution before titration?

