

Chemistry 101 Quiz # 5 Solutions

Monday's Version

1. What is the molarity of the acid when a 10.0 mL sample of hydrochloric acid (HCl) is titrated with 25.2 mL of 1.0 M KOH solution?

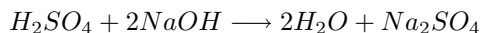


$$0.0252 \text{ L} \times 1.0M = 0.0252 \text{ moles KOH}$$

$$0.0252 \text{ moles KOH} \times \frac{1 \text{ mole HCl}}{1 \text{ mole KOH}} = 0.0252 \text{ moles HCl}$$

$$\frac{0.0252 \text{ moles HCl}}{0.010 \text{ L}} = 2.52 \text{ M}$$

2. What is the molarity of the acid when a 25.0 mL sample of sulfuric acid (H₂SO₄) is titrated with 13.5 mL of 0.100 M NaOH solution?



$$0.0135 \text{ L} \times 0.100M = 0.00135 \text{ moles NaOH}$$

$$0.00135 \text{ moles NaOH} \times \frac{1 \text{ mole H}_2\text{SO}_4}{2 \text{ mole NaOH}} = 0.000675 \text{ moles H}_2\text{SO}_4$$

$$\frac{0.000675 \text{ moles H}_2\text{SO}_4}{0.0250 \text{ L}} = 0.027 \text{ M}$$

Tuesday's Version

1. What is the molarity of the acid when a 20.0 mL sample of hydrochloric acid (HCl) is titrated with 15.2 mL of 2.0 M KOH solution?



$$0.0252 \text{ L} \times 1.0M = 0.0252 \text{ moles KOH}$$

$$0.0252 \text{ moles KOH} \times \frac{1 \text{ mole HCl}}{1 \text{ mole KOH}} = 0.0252 \text{ moles HCl}$$

$$\frac{0.0252 \text{ moles HCl}}{0.010 \text{ L}} = 2.52 \text{ M}$$

2. What is the molarity of the acid when a 10.0 mL sample of sulfuric acid (H₂SO₄) is titrated with 18.5 mL of 0.150 M NaOH solution?



$$0.0185 \text{ L} \times 0.150M = 0.00277 \text{ moles NaOH}$$

$$0.00277 \text{ moles NaOH} \times \frac{1 \text{ mole H}_2\text{SO}_4}{2 \text{ mole NaOH}} = 0.00139 \text{ moles H}_2\text{SO}_4$$

$$\frac{0.00139 \text{ moles H}_2\text{SO}_4}{0.0100 \text{ L}} = 0.138 \text{ M}$$