

Student Exploration: Titration

Activity A: Acids and bases

Get the Gizmo ready:

- Click **Reset**. Select **1.0 M HNO₃** for the **Burette** and **Mystery NaOH** for the **Flask**.
- Select **Phenolphthalein** for the **Indicator**.
- You will need a scientific calculator for this activity.



Question: How do acids and bases interact in solution?

1. **Describe:** The equation for the reaction of nitric acid (HNO₃) and sodium hydroxide (NaOH) is shown on the bottom right of the Gizmo.
 - A. What are the reactants in this reaction? HNO₃, NaOH
 - B. What are the products of this reaction? NaNO₃, H₂O
2. **Measure:** A **titration** can be used to determine the concentration of an acid or base by measuring the amount of a solution with a known concentration, called the **titrant**, which reacts completely with a solution of unknown concentration, called the **analyte**. The point at which this occurs is called the **equivalence point**.

Carefully add HNO₃ into the flask until the phenolphthalein begins to lose its color. Stop adding HNO₃ when the color change is permanent.

- A. How much (HNO₃) was required to cause the indicator to change color? 8.9mL
 - B. What can you say about the pH before and after the last drop of HNO₃ was added?
The pH was above 8.2 when it was pink before the last drop, after the last drop it is less than 8.2
3. **Explore:** Click **Reset** and change the indicator to **Bromthymol blue**. Add exactly 8.8 mL of HNO₃ to the flask.
 - A. What does the color of the indicator tell you about the current pH of the flask?
Since it is blue, it tells me that the pH is above 7.6
 - B. Add one more drop of HNO₃. What does the color tell you about the pH now?
Since it is yellow, I know that the pH is below 6.0

Activity B:

Get the Gizmo ready:



Titration Gizmo Answers

Ying Liu

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the author's name.

Titration Gizmo Answers:

Unveiling the Magic of Words: A Review of "**Titration Gizmo Answers**"

In some sort of defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their power to kindle emotions, provoke contemplation, and ignite transformative change is actually awe-inspiring. Enter the realm of "**Titration Gizmo Answers**," a mesmerizing literary masterpiece penned by a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve into the book's central themes, examine its distinctive writing style, and assess its profound impact on the souls of its readers.

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