

PhET Computer Simulation Activity: Acid-Base Solutions

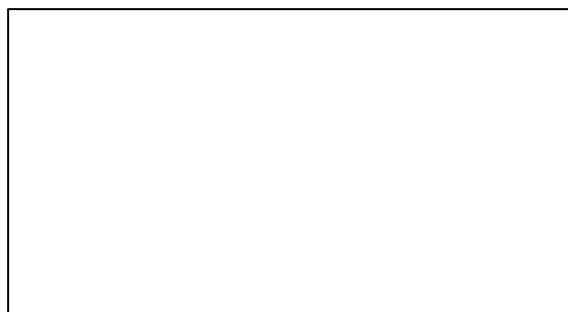
Introduction

1. Take a few minutes to **play** with the sim (<http://phet.colorado.edu/en/simulation/acid-base-solutions>). Check out both the Introduction and Custom Solution tabs. **Explore** what factors affect pH. **List** the factors you found that affect pH.

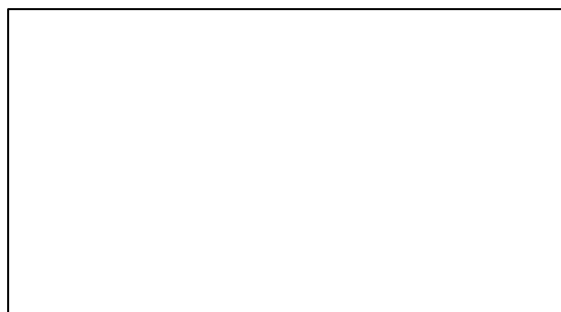
Investigating Concentration Changes

2. a. **Create** a strong acid solution in the “Custom Solution” tab.
b. **Draw** bar graphs for Initial and Equilibrium concentrations.
Hints: No calculator needed – try the ‘Equilibrium Concentration’ view.
Don’t forget to label your graphs!

Initial Concentrations



Equilibrium Concentrations



- c. What equilibrium concentrations are affected by changing the initial concentration?

3. a. **Create** a weak acid solution in the “Custom Solution” tab.
b. **Draw** bar graphs for Initial and Equilibrium concentrations.
Hints: No calculator needed – try the ‘Equilibrium Concentration’ view.
Don’t forget to label your graphs!

Initial Concentrations



Equilibrium Concentrations



- c. What equilibrium concentrations are affected by changing the initial concentration?

4. Are your results for the strong and weak acid in questions 2 and 3 consistent with the definition of strong and weak acids?

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Investigating the Effects of Acid Strength and Concentration

5. a. What does the 'strength' slider (in the sim) effect?

b. What does the term 'strength' mean? (In your own words)

6. How does strength affect the pH of acids?

7. How does initial concentration affect the pH of acids?

8. a. Is it possible for a solution of weak acid and a solution of strong acid to have the same pH? Design and carry out an experiment using the simulation to answer this question. What are your results?

b. What was your strategy for testing whether a solution of strong acid and a solution of weak acid can have the same pH?