

No abstract due on this lab, but...

You will need to write a **procedure**, including a **recipe** for the buffer you will be making (i.e., how much of each component of the buffer and in what order they should be added, etc.). You will also need to take data to demonstrate the efficacy of your buffer. Notice that much of the data section will consist of pH information.

There are no questions, but you will need to write a conclusion, assessing how well your buffer buffered!

Photocopy the lab pages or tear out only the carbon-copy pages. Make sure the title and name are legible. This lab is **due Monday, February 6 in class**.

Chemistry 160

Lab 4: Making a buffer

Objective: Plan and make a buffer solution, and demonstrate its buffering characteristics.

Introduction: Buffers are extremely useful solutions because of their ability to resist rapid pH changes as other solutions are added. In this lab, you will be making a buffer out of solid potassium acetate ($\text{KC}_2\text{H}_3\text{O}_2$, molar mass = 98.14 g/mol) and a stock solution of acetic acid ($\text{HC}_2\text{H}_3\text{O}_2$, sometimes written CH_3COOH , molar mass = 60.05 g/mol).

Prelab: Let me know **who you plan to work with** for this lab (teams of **two** people, please), and I will assign you and your partner the pH I want your buffer to be.

In advance, write a recipe for making 50.00 mL of a buffer at the pH you have been assigned using sodium acetate and acetic acid. The recipe should include the mass of potassium acetate you will use and the volume of the stock solution of acetic acid you will use, along with steps to explain how you will make the buffer. The final concentration of the acetic acid should be 1.00 M; the sodium acetate concentration should be adjusted accordingly for the final pH of your buffer.

Materials provided:

- solid potassium acetate
- 50 mL volumetric flask
- concentrated hydrochloric acid
- various other glassware as needed
- stock 6.0 M solution of acetic acid
- digital pH meter
- concentrated NaOH solution

Safety issues: There will be acids and bases in this lab; please wear goggles and tie back long hair. In addition, there will be plenty of glassware so be aware of your surroundings while you are working and while you are transporting glassware.

Procedure:

During lab: After your buffer has reached the required pH, call me over and demonstrate that your buffer is at the proper pH, and then, by adding a few drops of HCl or NaOH, that the pH of the buffer does not change by more than 0.2 pH units.

Waste: Please pour all solutions into the waste container provided; Metro requires that any solution poured into the drains be between pH 5.5 and pH 12. I will check after lab that we meet this requirement.