Required Training

UC Lab Safety Fundamentals

Required PPE

Lab coat, safety glasses/goggles, nitrile gloves

Equipment

2- 250ml graduated cylinders

Chemicals

100ml 1M Acetic Acid

29ml of 17.5 M Acetic Acid, glacial Qs to 500ml

Splash pan.

100ml Buffered Acetic Acid (1M acetic acid/1M Sodium Acetate)

136.1g Sodium Acetate Trihydrate + 57ml of 17.5 M Acetic Acid, glacial Qs to 1000ml

2-5 g Calcium Carbonate

Procedure:

1. Add 100ml 1M acetic acid to a 250ml Graduate cylinder.
2. Add 100ml buffered acetic acid to a 250ml Graduate cylinder.
3. Pour 5 g calcium carbonate into each graduated cylinder.
4. Observe the difference between the reactions of the acid solution and the buffered acid solution.

Discussion:

How it works:

A buffered solution is one that resist change in its pH when an acid or base is added to it. Buffers typically contain a weak acid and a salt of the weak acid, or a weak base and salt of the weak base.

This demo shows that a solution containing both acetic acid and sodium acetate resist changes to pH when the calcium carbonate is added. First a small amount of carbonate is added to an acid, the pH changes dramatically and the reaction can be observed through the formation of calcium acetate and carbon dioxide.

\[ \text{CH}_3\text{COOH} + \text{Ca}\text{CO}_3 \rightarrow \text{Ca(}\text{CH}_3\text{COO}\right)_2 + \text{CO}_2 + \text{H}_2\text{O} \]
When the same amount of acid is added to the buffer solutions the pH does not change dramatically thus there is an absence of the visual reaction.

**Hazards:**

Wear gloves and splash goggles. Caution: Acetic acid is a weak acid.

**SOP**

N/A

**Disposal (by Storeroom)**

Once neutralized the solutions may be rinsed down the drain with copious amounts of water.

**Acknowledgement and adapted from:**