

# Instructional Context

This diagram is a laboratory instruction diagram for a General Chemistry II lab at the post secondary level. This diagram was shown live on monitors around the lab for students to review alongside their labbooks during the period.

Students were expected to perform proper dilution and titration techniques on an antacid tablet and on a sample of a standard  $\sim 1$  M HCl reagent.

Follow up lab assessment from this experiment required them to use calculations to determine the exact molarity of the HCl reagent and the acid neutralizing capacity of the antacid by  $\sim \text{H}^+$  molarity neutralization per tablet and effectiveness by cost of antacid bottle (Brand).

This example focusses on the in-lab procedure only.

## Learning Objectives

- practice dilution techniques
- practice titration techniques
- practice lab safety when working with concentrated acids and bases
- experimental understanding of lecture taught acid-base theory --> as seen by colour change of indicator

## Instructional Design Notes

This diagram was developed to simplify a multi-step titration procedure for students performing the experiment in real time. The visual workflow allowed students to follow the procedure without repeatedly consulting dense written instructions in their labbook.

# CHEM 2000

## Expt: Acid Neutralizing Capacity (ANC)

### Precautions

- HCl is corrosive
- NaOH is caustic
- \* wear gloves when handling compounds

### Calculations

$$C_1 V_1 = C_2 V_2$$

↳ sig. figs. = 4

↳ 1 mol HCl = 1 mol NaOH at equivalence point.

### Reminder

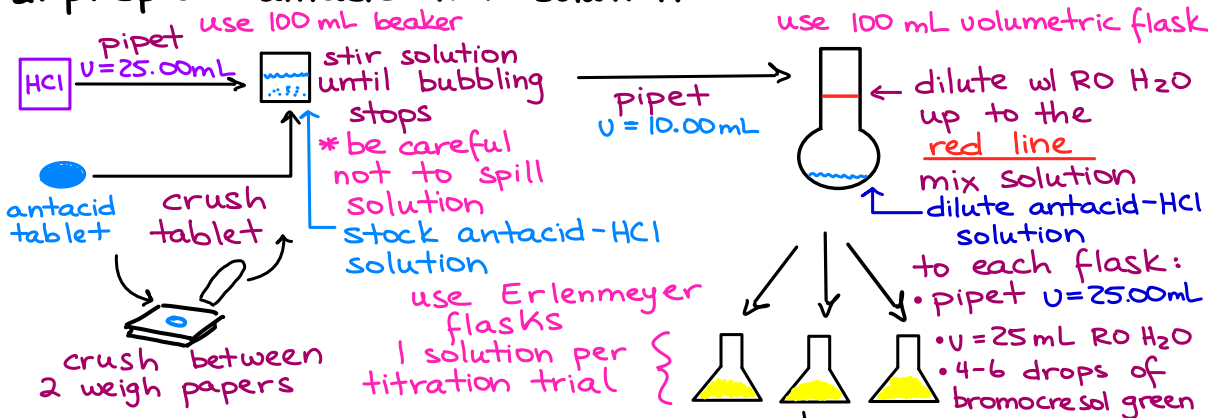
sheet pipets w/ solution before use!

## Part A: ANC of an Antacid Tablet

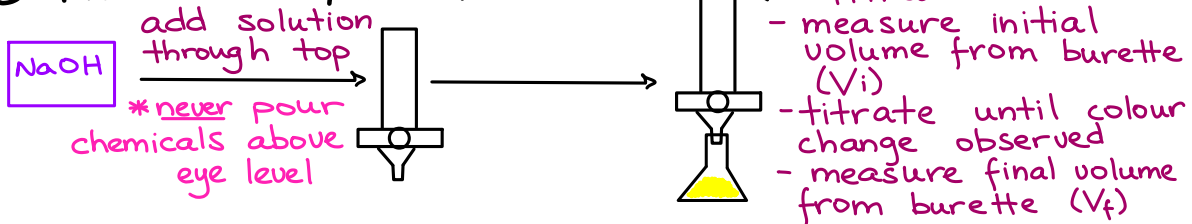
### 1. collect from TA's (at front)



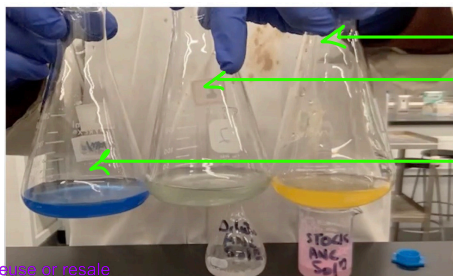
### 2. prepare antacid-HCl solution



### 3. titration w/ NaOH



### 4. clean station and check out w/ TA's



before titration

intermediate (close to endpoint)

endpoint: solution fully neutralized

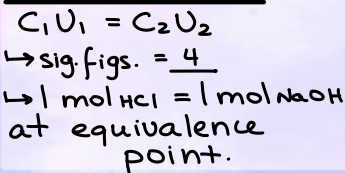
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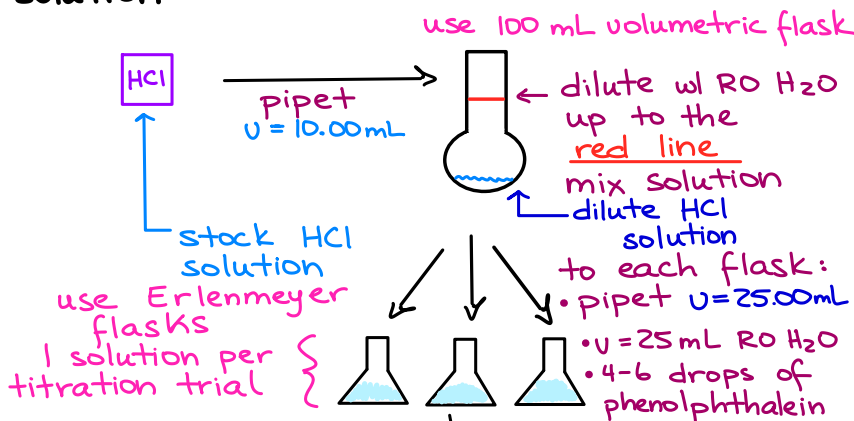
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## Part B: Standardization of HCl

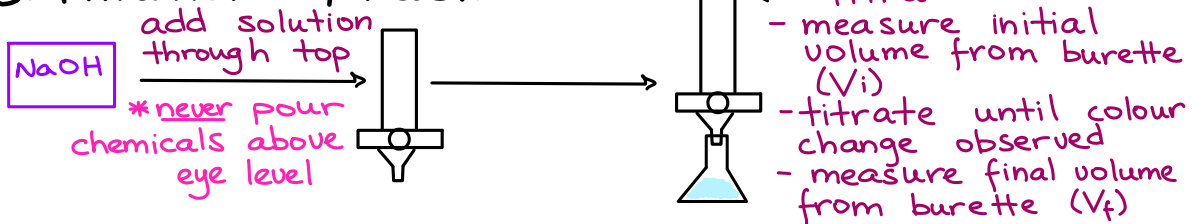
### 1. collect from TA's (at front)



### 2. prepare HCl solution



### 3. titration w/ NaOH



### 4. clean station and check out w/ TA's

