

Neutralize adequately



**ASSIGN
BUSTER**

Introduction:

An effective antacid should be able to neutralize adequately in order to alleviate pain and discomfort.

Problem: to investigate the effect of different kinds of antacid. Compare the neutralization ability of antacids. Infer which antacid(s) tested is most effective.

- Hypothesis: In this experiment I plan to use five different antacids with same mass, and use a titration method to determine the effectiveness of an antacid and to find which antacid neutralizes the most moles of stomach acid (Hydrochloric acid).

Variables:

- Independent variables: antacid tablets
- Dependent variables: the moles of HCl neutralized by each antacid
- Constants variables: temperature, the concentration of hydrochloric acid, the concentration of aqueous sodium hydroxide base, the volume of hydrochloric acid, amount of each antacid (0.5g).

Procedures**Apparatus:**

- 250cm³ beaker (5)
- 400cm³ beaker (15)
- A 50cm³ burette 0.05cm³
- 250cm³ measuring cylinder (15)
- A plastic funnel
- Microspatula

- Mortar and pestle
- Burette clamp
- ring stand
- stirring rod
- wax pencil and label
- balance
- Materials
- Antacids tablets

Brand Name	Active Ingredient	Dosage
Rennie	Calcium Carbonate 680mg Heave magnesium m carbonate	2 tablet s
Asilone Antacid	Dimeticone 270mg Aluminium hydroxide 500mg	1-2 tablet s

Gaviscon Magnesium 1-2

	Carbonate	tablet
		s
Alka-	Sodium	1-2
Seltzer	Bicarbonat	tablet
	e	s
	Aluminum	
		1-2
Mylanta	Hydroxide/	tablet
	Magnesium	
		s
	Hydroxide	

- Aqueous standardized Hydrochloric acid (HCL), 2M (200cm³ 15)
- Aqueous standardized Sodium hydroxide (NaOH), 2 M (200cm³ 15)
- Phenolphthalein indicator (15cm³)
- Distilled water (200cm³)

Warning:

- Always put on safety goggles, gloves, and a lab apron to protect your eyes and clothing.
- Do not touch any chemicals.
- Make sure that equipments are clean and dry.
- A clean burette should drain smoothly, and there should not be drops left behind sticking to the walls of the drain burette.

Procedure:

1. Label a set of five 400cm³ beakers 1, 2, 3, 4 and 5.
2. Obtain five different antacid samples.
3. Prepare one sample per beaker.

4. Crush one tablet, using a mortar and pestle. Make the powder as fine as possible.
5. Using a weighing bottle (or equivalent container), weigh out 0.5g of a tablet.
6. Transfer it to a 400cm³ beaker using a microspatula. Be careful not to lose any of the powder.
7. Measure 200cm³ of 2M HCl using a 250cm³ measuring cylinder. Use some of 200cm³ of 2M HCl to rinse the weighing bottle to prevent losing any of the powder.
8. Pour this into the 400cm³ beaker. Use a stirring rod to help dissolve the crushed tablet.
9. Obtain a 50cm³ burette. Make sure that the burette is clean and dry.
10. Attach a burette clamp to a ring stand. Insert a 50cm³ burette in the burette clamp. Make sure that the burette is vertically positioned.
11. Fill a 250cm³ beaker with approximately 225cm³ of 2M NaOH.
12. Carefully pour some of the 2M NaOH from the beaker into the burette to rinse the walls of the burette thoroughly with this solution.
13. Allow the solution to drain through the stopcock into the waste beaker. Close the stopcock.
14. Rinse the burette two more times in this manner, using a new 5cm³ portion of NaOH solution each time.
15. Fill the burette above the zero mark with 2M NaOH.
16. Place a 250cm³ beaker under the burette, and withdraw enough solution to remove any air from the burette tip and to bring the liquid level within the graduated region of the burette. Record the initial volume of NaOH in Table 1.

17.) Add 10 drops of the phenolphthalein indicator to the cooled solution of antacid tablet containing the unreacted acid. The solution should be translucent. Gently swirl the beaker to mix.
18. Place a white tile under the burette. Add NaOH dropwise with continuous swirling.
19. A spot of pink solution may appear where the drops hit, which will disappear with swirling.
20. Stop adding NaOH when as soon as the mixture just changes colour from colourless to pink.
21. Record the final burette reading in Table 1.
22. Repeat the same experiment twice more to get an accurate result.
23. Rinse it with distilled water before placing it in the next sample. Repeat the steps for the remaining antacid samples.
24. When finished with experimental work, rinse the burette and leave it filled with pure water.

Equation for each antacid :

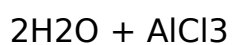
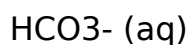
Brand

Equation

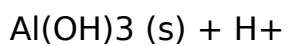
Name

Rennie $2\text{HCl} + \text{CaCO}_3 \rightarrow$
 $\text{H}_2\text{O} + \text{CO}_2 +$
 CaCl_2

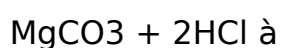
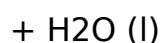
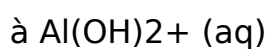
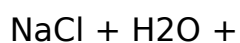
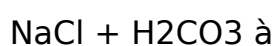
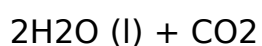
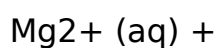
 $\text{CaCO}_3 (\text{s}) + \text{H}^+$
 $\rightarrow \text{Ca}^{2+} (\text{aq}) +$



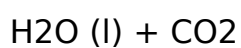
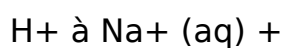
Asilone



Antacid

Gaviscon $\text{MgCO}_3 + 2\text{H}^+ \rightarrow$ 

Alka-

Seltzer $\text{NaHCO}_3 \text{ (s)} +$ Mylanta $2\text{HCl} + \text{Mg(OH)}_2$

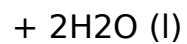
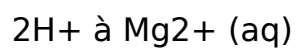
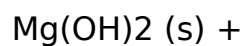
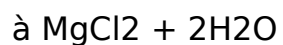


Table 1

1st	2nd	3rd	4th	5th
tabl	tabl	tabl	tabl	tabl
et	et	et	et	et

Brand

Name

1st

Trial

Initial

Value

(cm³)

Final

Value

(cm³)

Final

Value

-

Initial

Value

(cm³)

2nd

Trial

Initial

Value

(cm³)

Final

Value

(cm³)

Final

Value

-

Initial

Value

(cm³)

3rd

Trial

Initial

Value

(cm³)

Final

Value

(cm³)

Final

Value

-

Initial

Value

(cm³)