

# [Neutralize adequately](https://assignbuster.com/neutralize-adequately/)

### 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 carbonate 80mg | 2 tablets |
| Asilone Antacid | Dimeticone 270mg Aluminium hydroxide 500mg | 1-2 tablets |
| Gaviscon | Magnesium Carbonate | 1-2 tablets |
| Alka-Seltzer | Sodium Bicarbonate | 1-2 tablets |
| Mylanta | Aluminum Hydroxide/ Magnesium Hydroxide | 1-2 tablets |

* 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 transulent. 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 Name | Equation |
| Rennie | 2HCl + CaCO3 à H2O + CO2 + CaCl2  CaCO3 (s) + H+ à Ca2+ (aq) + HCO3- (aq) |
| Asilone Antacid | 2HCl + Al(OH)3 à 2H2O + AlCl3  Al(OH)3 (s) + H+ à Al(OH)2+ (aq) + H2O (l) |
| Gaviscon | MgCO3 + 2HCl à MgCl2 + H2O + CO2  MgCO3 + 2H+ à Mg2+ (aq) + 2H2O (l) + CO2 (g) |
| Alka-Seltzer | HCl + NaHCO3 à NaCl + H2CO3 à NaCl + H2O + CO2  NaHCO3 (s) + H+ à Na+ (aq) + H2O (l) + CO2 (g) |
| Mylanta | 2HCl + Mg(OH)2 à MgCl2 + 2H2O  Mg(OH)2 (s) + 2H+ à Mg2+ (aq) + 2H2O (l) |

Table 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 1st tablet | 2nd tablet | 3rd tablet | 4th tablet | 5th tablet |
| 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) |  |  |  |  |  |