The Real Power of Antacids

Abstract:

Many antacid brands state that they are fast acting or take very little time to treat the symptoms. So, if Milk of Magnesia is added to Hydrochloric Acid as opposed to other solid antacids, then it will effectively neutralize the stomach acid. Milk of Magnesia is said to treat stomach issues better than any other brands. After the experiment was completed, it was found that this hypothesis was proved wrong and Milk of Magnesia does not neutralize stomach acid as effectively as the other solid types of antacids that were tested.

Problem:

What is the best form of antacid and does it really matter which kind to use?

Hypothesis:

If the Milk of Magnesia is added to the portioned out Hydrochloric Acid opposed to the other solid antacids, then it will more effectively neutralize the simulated stomach acid.

Introduction:

Antacids are used primarily to relieve an upset stomach due to an abundance of acidic foods. Antacids are taken by mouth to relieve heartburn, the major symptom of gastroesophageal reflux disease, or acid indigestion. Treatment with antacids alone is symptomatic and only justified for minor symptoms. If an antacid is taken to often, then milk-alkali syndrome can happen, which has serious toxicity and can be fatal. A neutral pH level at 7.0, so antacids are used to bring a low pH level like 2.0 back up to 7.0. Antacids typically do not bring a stomach all the way back to neutral but it will bring it close. A time of 20 minutes was chosen because that is the typical time needed to let the antacids react. There are five different types/brands of antacids chosen to carry out this project. Those five are Calcium Carbonate Tums Brand and Rite Aid Brand, Sodium Bicarbonate Alka-Seltzer brand and Rite Aid brand, and finally Milk of Magnesia Rite Aid brand. A constant amount of each antacid was portioned out, 2.88 grams. This portioned amount of each antacid will be added to 50 ml of Hydrochloric Acid. The antacid will stay in the beaker of HCl for 20 minutes, and the pH level will be taken at the end of this time frame. There will be five trials for each antacid. This will give a great average for the experiment. This experiment had some difficulty when it came to the procedure. The first procedure did not work out as planned and a new one had to be produced. The new procedure worked better and gave better results.

Discussion:

During the experimentation, it was found that the Rite Aid brand of Calcium Carbonate is the best choice to neutralize stomach acid. The original hypothesis was 100% incorrect. The results actually made the hypothesis the complete opposite of the truth (This can be easily seen in Table 1 and Graph 1). So, the data shown in the graph disproves my original hypothesis. There were multiple things in this experiment that could have caused some human error. For example, the time from pouring the antacid into the HCl until I actually clicked start on the 20 minute timer. There was also the possible error in the amount of antacid scrapped into the beaker, some could have been left behind in the grinding dish. This project definitely had a surprising outcome that was most certainly not expected. When this project was started, the expectation was that Milk of Magnesia would have the highest pH level out of the other four antacids, but it turned out to be the complete opposite. The off brand Calcium Carbonate had the highest pH level after the 20 minute time frame. So, this project definitely had some different outcomes.

Results:

As seen in graph #1, the Rite Aid brand of Calcium Carbonate brought the pH level closest to 7.0, or neutral. Milk of Magnesia on the other hand did not bring the pH level near as close to 7.0 as the other four antacids did. This proves the hypothesis was wrong and that the complete opposite of the hypothesis is true. The Milk of magnesia brought the pH level to 4.13, whereas the Rite Aid brand of Calcium Carbonate brought the pH level to the highest number of 5.99. This is very surprising and was not what was expected.

Applications:

This experimentation can be very helpful when it comes to buying antacid for an upset stomach. So, as proved in the experiment, Calcium Carbonate is the best way to go. This project could also be used to prove the makers of Milk of Magnesia product wrong showing them the results of the testing done with their product. These are very surprising results and could show a lot of people what they should be using for an upset stomach. This project could be further expanded by using an extensive amount of time for testing, this would give even better results that could be used to support this experiment.

Conclusion:

The hypothesis saying that “If the Milk of Magnesia is added to the portioned out Hydrochloric Acid opposed to the other solid antacids, then it will more effectively neutralize the simulated stomach acid”, is incorrect and should be written so that Calcium carbonate will be the most effective at neutralizing stomach acid. This is shown in the graph shown to the right. To answer the problem stated, Yes it does matter which antacid to use and the best form to use is the Rite Aid brand of Calcium Carbonate. This project was not done to turn people away from other types of antacid, but rather to show the public which type is the better choice for a “fast acting” upset stomach reliever.

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