

Background: Volcanoes tend to erupt either in a violently explosive manner or in quiet and non-explosive manner. To determine why this happens we will be using alka seltzer and some model volcanoes that will help us better understand why this happens. Think of the amount of alka seltzer as the amount of silica present in volcanic magma. Also, stop to consider what we have already covered in class.

Purpose: To investigate which factors determine whether a volcano will erupt violently (explosive) and which factors determine whether a volcano will erupt quietly (non-explosive).

Hypothesis: Which type of magma (basaltic or rhyolitic) do you think will produce a more explosive eruption? _____

Materials: Alka Seltzer (silica), film canister, volcano, scale

Procedure:

Basaltic Magma: Read Carefully!!!

1. Make sure the lid on your basaltic magma has holes along the top of it. Do not mix up the lids or it will affect your data.
2. Fill up your film canister with 30 mL of water (up to the blue line) and add 2 drops of red food coloring.
3. While one person is filling up the film canister, have another person weigh out 0.5 grams of alka seltzer (silica).
4. Record the amount of alka seltzer or *silica* in your results table.
5. Insert your basaltic magma into your volcano without the lid on.
6. Read carefully, the next step happens fast. Place your alka seltzer (silica) into your film canister and QUICKLY place the lid over the film canister. Immediately after you do this, start timing. **Stop** the timer when the lid pops or off after 2 minutes if nothing happens. **Record your observations in your results in the data table.**
7. Plot your data point (amount of silica vs. time) from trial 1 on the graph below.
8. Pour your basaltic magma down the drain and clean up any mess.

Rhyolitic Magma:

1. Make sure the lid on your Rhyolitic magma has NO holes in the top of it. Do not mix up the lids or it will affect your data.
2. Fill up your film canister with 20 mL of water (up to the blue line) and add 2 drops of red food coloring.
3. While one person is filling up the film canister, have another person weigh out 0.75 grams (a little more than a quarter 1/4 tablet) of alka seltzer.
4. Insert your Rhyolitic magma into your volcano without the lid on.
5. Read carefully, the next step happens fast. Place your alka seltzer (silica) into your film canister and QUICKLY place the lid over the film canister. Immediately after you do this start timing! **Stop** the timer when the lid pops or off after 2 minutes if nothing happens. **Record your observations in your results in the data table.**
6. Pour your Rhyolitic magma down the drain and clean up any mess.
7. Repeat steps 1-7 but, instead of 0.75 grams of alka seltzer (silica) used in trial 1 use 1.5 grams (1/2 tablet) of alka seltzer (silica) in trial 2 and about 3.0 grams (about a whole tablet) of alka seltzer (silica) in trial 3. Record your results and any observations.
8. Plot your data points (amount of silica and time) from trials 1, 2, and 3 on the graph below. Now construct a line graph by connecting all your data points and analyze your graph.

Data:

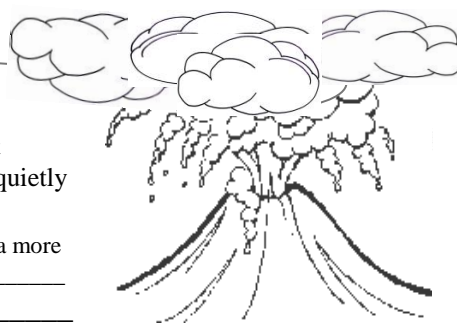
Basaltic Magma:	<i>Trial 1</i>
<i>Amount of silica or alka seltzer:</i>	_____grams
<i>Time:</i>	___ : _____
<i>Observations:</i> Did it explode or not explode? Why or why not?	Explain:

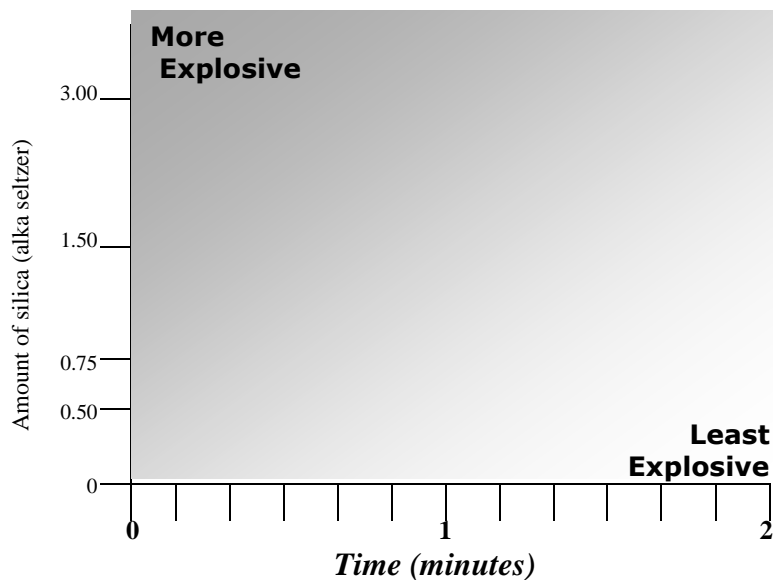
Rhyolitic Magma:	<i>Trial 1</i>	<i>Trial 2</i>	<i>Trial 3</i>
<i>Amount of silica or alka seltzer</i>	_____grams	_____grams	_____grams
<i>Time:</i>	___ : _____	___ : _____	___ : _____
<i>Observations:</i> Did it explode or not explode? Why or why not?	Explain:	Explain:	Explain:

Name _____

Date _____ Period _____

Volcano Lab





Conclusion: (answer in complete sentences)

1. What was the purpose of this lab?

2. Which factors do you feel determine how a explosive a volcano will erupt?

3. Which magma released gases? Did it produce a quiet or explosive eruption?

4. Which magma trapped gases? Did it produce a quiet or explosive eruption?

5. Considering your answers to questions 3 and 4, compare and contrast basaltic magma with rhyolitic magma:

6. Look at your graph, did your volcano become more or less explosive when you added silica or alka seltzer to your magma? Explain:

7. Considering what we have learned in class, explain in detail why some volcanoes erupt violently and explosively while others erupt quietly and non-explosively:

8. Which factors determine the how explosive a volcano will be (circle all that apply):
Volcano size amount of silica in magma amount of trapped gases

9. (20 points) In 2-3 sentences, explain why some volcanoes erupt explosively and others erupt quietly: