



Chemistry

Hydrogen Peroxide Volcano

This volcano is more reactive than a standard vinegar and baking soda volcano; **proper protective gear and parental supervision are absolutely necessary**. The hydrogen peroxide volcano, also called “Elephant Toothpaste” demonstrates how a catalyst works in chemistry. Hydrogen peroxide naturally wants to break down into water and oxygen ($2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$). This process usually happens too slowly to be easily perceived and this is where our catalyst comes in. In this case, our catalyst is the yeast which will help to speed up the decomposition process.



Supplies

- Three(3) Tablespoons of room temperature water in a bowl
- One (1) Packet dry yeast
- One (1) Recycled water or soda bottle
- One (1) Tablespoon of liquid dishwashing soap
- One (1) Funnel
- One (1) Stir stick (popsicle stick works fine)
- One (1) Safety goggles per person participating
- One (1) Pair of rubber gloves per person participating
- Half (1/2) Cup 3% Hydrogen Peroxide
- Optional: Food coloring



Challenge

Make your own elephant toothpaste!

1. Rinse bottle thoroughly, and place upright in sink
2. Use funnel to add hydrogen peroxide to bottle
3. If you would like, you can add 5-8 drops of food coloring to bottle
4. Add dishwashing liquid and gently agitate mixture by swirling and not forming bubbles
5. Add yeast to the bowl of room temperature water, mix with the stir stick for 30 seconds (it should become the consistency of melted ice cream)
6. Use funnel to add yeast mixture to hydrogen peroxide mixture
7. Remove funnel and watch the reaction!



Questions

1. This reaction is **exothermic** which means it produces heat. Do you see steam?
2. Try the experiment again in a different container. Does the size of the container make a difference?