



14. WILD BLACK CARBON SNAKE 5 points L3+ 20 min

SUPPLIES:

Chem. Possibilities

- Sand
- Lighter Fluid/Powdered sugar./Baking soda
- Any pan or bowl
- Safety glasses



INTRO:

One of the famous demos of Chemistry classes is the Black Snake Demo. It's quite simple to do and the effect is dramatic. Basically you're "burning" sugar with sulfuric acid. Here's a few videos of it.

King Of Random <https://www.youtube.com/watch?v=Rzj6PTMEHIM>

Crazy Russian Hacker <https://www.youtube.com/watch?v=poDBrGlyTEk>

What happens when you burn sugar? ITS sci. <https://www.youtube.com/watch?v=0qZzP4k4vV8>

Chem-ed <https://www.chemedx.org/video/dehydration-sucrose-sulfuric-acid>

Here are some nice additions:

Don't Try This At Home <https://www.youtube.com/watch?v=Zq9Wmu7Z-6S> This This Also Has An Explanation.

PROCEDURE:

You can do a similar experiment without the very dangerous Sulfuric Acid.

- Make a mound of sand about 3" high and put a dimple in it about 1" Sprinkle in about 5-7 seconds of lighter fluid.
- Take 4 cups of powdered sugar and pour it into the depression in the sand . Light it. Observe.
- Do the same thing only this time add 1 cup of baking soda to the 4 cups of sugar. Light it and observe..
- To see it done, go to: Black Snake Science Experiment Crazy Russian Hacker

<https://www.youtube.com/watch?v=8jNG8w0IJ4U>



WHAT'S

IN THE SULFURIC ACID DEMO

It's a bit mind bending to grasp what's really going on here. Here's the formula. See if you can understand it.



S means solid and l means liquid....

Sucrose (table sugar) is the molecule $C_{12}H_{22}O_{11}$.

The snake that solidifies a little is basically pure carbon—the very same atoms that make a pencil lead and a diamond. The total rest is water. So sugar is being converted to pencil lead and water!—totally! The water is vaporized and this causes it to grow.

Because water is involved this way, in chemistry this is an example of being "dehydrated". When the molecular bonds break, heat is released making it an exothermic reaction. The surface area that the acid can react with hugely affects the speed of then reaction. Powdered sugar is fastest and cubes are slowest

IN THE LIGHTER FLUID DEMO

In this demo, before the baking soda was added, it is merely burning the sugar. When the baking soda is added, CO₂ is being given off by the baking soda causing it to grow like the other "black snake did."

FOR POINTS, YOU MUST WATCH ALL THE VIDEOS, DO THE BAKING SODA EXPERIMENT HERE AND DO THE QUESTION BELOW.

QUESTION: 1. In your own words describe both reactions.

