

Candy Conflagration

https://www.youtube.com/embed/J5vZ_wuDK9w

This demonstration is an exciting way to show the parts needed for a combustion reaction. There is a lot of possible information to include in this demonstration, making it versatile in the age ranges it can be used with.

Materials

- Test tubes
- Ring stand with ring clamp
- Blowtorch
- Scoopula
- Sodium Chlorate or Potassium Perchlorate salt
- Small candies (Nerds, Sour Patch Kids, Gummy Bears, etc)
- Goggles
- Heat gloves

Safety Precautions

Please read the Fire Safety section of the [Demonstration Safety](#) page before performing this demonstration.

Demonstration

1. Using the scoopula, scoop some of the salt into the test tube. fill the test tube no more than a quarter inch with the salt; too much salt and the demonstration won't work as well. Aim the test tube perpendicular to the audience. If you aren't at least 10 feet away from the audience, a blast shield is required.
2. Place some of the candy onto the scoopula, making sure that it is in small enough pieces to fit into the test tube. Set nearby.
3. Ask the audience to name the three things needed for a fire. After you get the answers, explain the purpose of the blowtorch (Heat), candy (Fuel) and salt (Oxygen).
4. Put on the goggles and heat gloves, and start heating the salt with the blowtorch. As you heat the salt, be sure to move the flame of the blowtorch around. If you keep it on one spot for too long, it may melt the glass!
5. When you see that most of the salt is melted, ask the students for a countdown starting at 5. As they countdown, pick up the scoopula, and when they reach one pour the candy into

the test tube.

- If the reaction does not start immediately, continue to heat the test tube until it starts.

6. After it finishes, let the test tube cool for a few minutes, then remove it while still wearing the hot gloves. It can be thrown away.

Why This Works

Chemistry

Combustion Reactions are common reactions where we see heat as a result of the reaction. In order to have a combustion reaction, we need to have a fuel source, an Oxygen source, and a heat source. The fuel source, in this case, is the candy that we add to the test tube. Candy has a lot of sugar in it, and sugars contain a lot of energy in them. Our Oxygen source is the salt that we added at the beginning. Sodium Chlorate and Potassium PerChlorate both have a lot of extra Oxygen stored in them. This extra Oxygen is released when we heat the salt up and melt it. The blowtorch was the heat source, and by providing enough heat for the salt to melt, we can then add in the candy and watch it burn! As it burned, you should see a color to the flame in the test tube. The color is there because of the salt! Sodium gives off an orange flame when heated, and Potassium gives off a purple flame.

Biology

For a combustion reaction you need three things: a heat source, like the blowtorch, an Oxygen source, and a fuel source. The (Per)Chlorate salt was our oxygen source, since it had a lot of extra oxygen stored in it which we released by heating it. The candy that we added was our fuel source for this reaction. Candy has a lot of sugar in it, and that sugar has a lot of energy stored inside of it. The small amount of candy added to the tube would have contained a little more than two Calories of energy in it. We use a capital C on Calories, however, because it actually stands for kilocalories. In other words, our two Calories is actually two thousand calories! Our bodies can use this energy, however, so that we can walk, talk, think and experience the world around us!

Additional Information

The amount of energy released in using 10 Nerds is roughly equivalent to the following:

1. The amount of body heat the average adult produces in 2.5 minutes!
2. The energy needed to run a 120 Watt bulb for 80 seconds!
3. The energy it would take to lift a medium sized tomato 5.8 miles into the atmosphere!
4. The energy needed to lift 10 US dollar bills (any monetary amount, they all weigh the same) from the ground into orbit!
5. The energy needed to lift a honey bee larvae (first born, roughly 0.003-0.009 grams) from the earth to the moon (approximately 230,100 miles)!

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