

Sacrificial Gummy Bear (#32)

TOPIC: Electrochemistry

Demo-032

The Sacrificial Gummy Bear

This demonstration vividly and dramatically illustrates the concept of the effect that a strong oxidizer has on a fuel. It should be performed by an instructor to ensure proper safety procedures are followed. It should be done in a room with very good ventilation and preferably in a fume hood.

MATERIALS

- A small package of *gummy bears*
- Ring-stand and clamp
- One medium sized pyrex test tube
- Around 25 g of solid potassium chlorate (KClO_3)
- Safety shield, goggles, gloves, and a lab coat
- Meker burner & striker
- Tongs or long forceps
- Water (in the event that the test tube breaks during the reaction)

PRESENTATION

1. Set up the meker burner so that is about 1 inch from the bottom of the test tube
2. Make sure that everything is behind the safety shield(**This reaction will be very messy as often times the test tube will shatter**)
3. Fill the test tube with the KClO_3 provided and ignite the burner
4. Once the KClO_3 is melted (this usually takes about 5 minutes) a gummy bear can be dropped in with tongs. The reaction will begin almost immediately. (while the KClO_3 is melting is a good time to explain what's going to happen or ask the class which color of gummy bear to sacrifice)

5. The gummy bear will start bouncing around in the test tube violently making a “screaming noise” and emitting purple/orange flames along with a lot of smoke/steam. This will last about 1 minute.

DISCUSSION

The gummy bear is mostly sugar, which is easily oxidized by something like molten potassium chlorate. Ideally, a balanced equation would show sucrose ($C_{12}H_{22}O_{11}$) being converted to carbon dioxide and water while the $KClO_3$ becomes KCl . The reaction will not be perfectly balanced in the demonstration as an excess of $KClO_3$ works much better.

HAZARDS

Molten $KClO_3$ can cause *very severe burns*. Think of your skin or the top of the lab bench as another gummi bear. Exercise your best safety technique while presenting this demonstration. It will set a good example for your class. There is also a lot of smoke produced during the oxidation as well as a good chance of the test tube breaking. **This experiment should only be done in a room with good ventilation or a fume hood.**

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