Oxygen and Fire

Summary

Students observe a teacher demonstration on how a candle goes out when covered by a jar.

Time Frame

1 class periods of 15 minutes each

Group Size

Large Groups

Materials

- candle
- matches
- clear jar
- 1 Erlenmeyer flask
- Hydrogen peroxide (store bought, not concentrated)
- Manganese Dioxide OR
- fresh, chopped up, beef liver, and wood splints

Background for Teachers

This is a teacher demonstration. Students observe a how a candle goes out when covered by a jar. They make a prediction about what would happen if there was more oxygen. Students then observe how a piece of wood reignites after being blown out and then dipped in an Erlenmeyer flask with a high concentration of oxygen.
If you are going to have the students do this on their own, reduce the amounts needed and have them make sure they use safety goggles. The Manganese Dioxide (a powder that should not be inhaled) is also not really safe so you may want to add it to the flasks for the students.
The Hydrogen Peroxide naturally decomposes into water and oxygen. The manganese dioxide acts as a catalyst to speed up the decomposition. Liver has a high concentration of the enzyme "catalase" which performs the same function as the manganese dioxide. Our bodies also have a large amount of catalase, this is why peroxide bubbles when we put it on a cut.

Instructional Procedures

NOTE: This demo has a better impact with the lights out.
Discussion Ideas: fire, flammability, evidence of chemical change.
Procedures:

- Hook activity -- Place a lit candle under a jar and allow it to go out. Discuss with the students why the candle goes out.
- Ask the students to predict what might happen if the flame was exposed to a higher concentration of oxygen.
- Place a small amount of manganese dioxide (or chopped liver) in an Erlenmeyer flask; tell the students that the reaction with the hydrogen peroxide will produce pure oxygen.
- Pour about 50 ml of Hydrogen Peroxide into the flask.
- Light a wood splint on fire and let it burn for a few seconds, blow it out and quickly dip it into the Erlenmeyer flask (be careful not to dip it into the liquid) it should re-light spontaneously.
- The blown out splint needs to have a little bit of a glowing ember on it to re-light, you can repeat the blowing-out / re-lighting process several times until the oxygen is used up.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

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