

The Magic Genie

Purpose

To demonstrate the rapid effect a catalyst has on the decomposition of hydrogen peroxide.

Materials

Florence flask covered with duct tape	safety shield (optional)
Rubber stopper	manganese dioxide
100 mL beaker	30% hydrogen peroxide

Procedure

1. Measure out about 50 mL of 30% hydrogen peroxide, using the 100 mL beaker, and pour it into the Florence flask.
2. Place about 2 spatulas of manganese dioxide into a Kimwipe, form it into a pouch, and tie it with a 20 cm piece of string. (Alternative: Empty a tea bag. Place 2 spatulas of MnO₂ in the empty tea bag and re-staple to the string.)
3. Carefully suspend the pouch above the hydrogen peroxide and hold it in place with a rubber stopper.
4. Set up a story about a magic bottle.
5. Remove the stopper and STEP BACK. A large puff of steam will be released.

Additional Information

1. 10% hydrogen peroxide can be used. It is not as dramatic, however.
2. $\text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} + \text{O}_2$ (MnO₂ is the catalyst)
3. Key concepts: role of a catalyst – exothermic reaction.

Question for the Students

- I. Predict the products of the reaction.

Disposal

The excess fluid in the Florence flask can be poured down the drain with excess water. The pouch containing the MnO₂ should be removed from the flask and thrown away in

the trash. Be sure to thoroughly clean flask to ensure that the next time it is used, the demo will work.

References

ICE Demonstration Workshop, University of Arizona, 1986