Genie in a Bottle: Decomposition of Hydrogen Peroxide

Instructions

Materials:
30% Hydrogen peroxide, H_2O_2
2-liter plastic soft drink bottle
Manganese dioxide, MnO_2
Ring stand with ring clamp

Safety: 30% hydrogen peroxide is corrosive. Avoid contact with skin and eyes. Use safety glasses.

Set Up:
1. Hold the 2-liter plastic soft drink bottle in place by slipping a ring over the bottle.
2. Take the bottle of 30% hydrogen peroxide out of refrigerator where it's normally stored.
3. Measure out 3-4 g of manganese dioxide. The fine powder solid works best.

Demo Procedure:
1. Carefully pour 50 mL of 30% hydrogen peroxide into the bottle.
2. Add manganese dioxide into the bottle and step away quickly.
3. The react is immediate and highly exothermic. A visible cloud of steam shoots out of the bottle.
4. The heat released can cause the bottle to shrink. The ring clamp helps keep the bottle in place.
5. Manganese dioxide is acting as a catalyst in this reaction, which means it can be used again. To demonstrate this point you can pour this content into a second bottle (with fresh hydrogen peroxide) and observe a similar reaction.

Waste Disposal: The solution, mostly water, can be pour down the drain. Pour the remaining wet MnO_2 solid into an evaporating dish or wide-mouth container and set it aside to dry. The dried MnO_2 can be reused multiple times.