

Luminescent Elephant's Toothpaste

Purpose

To demonstrate the effect of a catalyst (MnO_2) on the decomposition of hydrogen peroxide.

Materials

1000 mL graduated cylinder	MnO_2
150 mL beaker	2-3 glow sticks
50-75 mL liquid soap (Ajax)	plastic tub
50-100 mL 30% hydrogen peroxide	

Procedure

1. Place a 1000 mL graduated cylinder in a large plastic basin or dishpan.
2. Add 50 to 75 mL of liquid dishpan soap.
3. Dump in about a tablespoonful (15 mL) of MnO_2 powder, and swirl to mix into a suspension of the black solid.
4. Into a separate beaker pour 50 to 100 mL of 30% hydrogen peroxide (HANDLE WITH CARE).
5. Activate two or three light sticks of the desired color (high intensity types work best), cut them open with a razor blade knife, and empty the glowing contents into the beaker. The oily luminescent liquid will not mix with the H_2O_2 but stay as glowing droplets.
6. Turn out the lights, swirl both containers, and pour the contents of the beaker into the cylinder which is centered in the basin.
7. A luminescent column of suds with dark streaks will rise up and overflow the cylinder due to the decomposition of the H_2O_2 to H_2O and O_2 gas catalyzed by the MnO_2 .

Additional Information

1. When cleaning up and disposing of the remains be careful of the pieces of glass which were broken in the light sticks.
2. Ajax brand dish soap is essential for the reaction to glow. Dawn soap will not work.

3. The reaction is:



Disposal

Pieces from the glow sticks should be thrown away into the trashcan. Remaining solutions can be rinsed down the sink with excess water.

Reference

Chem 13 News, May 1997, p 8.