

Egg Sucker

What is Pressure?



Introduction

Drop a flaming ball of cotton into a flask, set a raw egg on top, and watch as the contents of the egg are “pushed down” into the flask. An easy-to-perform and colorful variation of the common *Balloon in the Bottle* demonstration.

Concepts

- Pressure differential
- Vacuum

Materials

Ethyl alcohol, $\text{CH}_3\text{CH}_2\text{OH}$, 95%, 3 mL

Beaker, 100-mL

Cotton ball

File or small screwdriver

Crucible tongs

Egg, raw

Stopcock grease

Butane safety lighter

Safety Precautions

Ethyl alcohol is flammable, a dangerous fire risk, and toxic by ingestion and inhalation. Keep away from sources of heat and flame. Wear chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron. Please consult current Material Safety Data Sheets for additional safety, handling, and disposal information.

Preparation

Use the end of a file or a small drill to make a small hole in the top and bottom of a raw egg. Place stopcock grease around the rim of the Erlenmeyer flask.

Procedure

1. Add approximately 3 mL of 95% ethyl alcohol to a 100-mL beaker containing a cotton ball.
2. Use the crucible tongs to remove the cotton ball from the beaker. Set the beaker away from the Erlenmeyer flask.
3. Light the cotton ball with the butane safety lighter, place the burning cotton ball into the Erlenmeyer flask, and quickly place the egg over the mouth of the flask.
4. Watch as the whites and yolk of the egg are pushed into the flask!

Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures, and review all federal, state and local regulations that may apply, before proceeding. The contents of the egg may be placed in the trash according to Flinn Suggested Disposal Method #26a. Any unused ethyl alcohol may be rinsed down the drain with excess water according to Flinn Suggested Disposal Method #26b.

Tip

• A hard-boiled, shelled egg can also be used in place of the balloon. In this case, the entire egg will be pushed into the Erlenmeyer flask.

Discussion

The *Egg Sucker* demonstration is an easy-to-perform and colorful variation of the common *Balloon in a Bottle* demonstration. Both demonstrations rely on the creation of a pressure differential set up between the inside and outside of the Erlenmeyer flask. The pressure outside the Erlenmeyer is still at atmospheric pressure (approximately 14.7 lb/in²). The flaming cotton ball causes hot gases to rush out of the flask. When the egg is placed on top, the gases cool inside the flask and results in a less-than-atmospheric pressure inside the flask. This pressure difference will cause the contents of the egg to be pushed into the flask. The contents are not “sucked” into the flask—they are pushed in by the greater atmospheric pressure that exists outside the closed system. The egg contents will continue to be pushed into the flask until the egg is “emptied.”

Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

Unifying Concepts and Processes: Grades K–12

Systems, order, and organization
Evidence, models, and explanation

Content Standards: Grades 5–8

Content Standard B: Physical Science, properties and changes of properties in matter, understanding of motions and forces

Content Standards: Grades 9–12

Content Standard B: Physical Science, structure and properties of matter, motions and forces

Reference

Shakhashiri, B. Z. *Chemical Demonstrations: A Handbook for Teachers in Chemistry*; University of Wisconsin: Madison; Vol. 2, pp 6–8.

Flinn Scientific—Teaching Chemistry™ eLearning Video Series

A video of the *Egg Sucker* activity, presented by Bob Lewis, is available in *What is Pressure?*, part of the Flinn Scientific—Teaching Chemistry eLearning Video Series.

Materials for *Egg Sucker* are available from Flinn Scientific, Inc.

Catalog No.	Description
E0009	Ethyl Alcohol, 95%, 500mL
AP1095	Stopcock Grease
AP8960	Butane Safety Lighter
FB0680	Cotton Balls

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.