Clouds in a Glass of Beer

Overview

This activity is based on book by Craig Bohren, *Clouds in a Glass of Beer: Simple Experiments in Atmospheric Physics.* The idea behind the book is this: Many everyday phenomena relate to the science behind weather and climate, and some simple observations can bring these phenomena to life.

This is the perfect capstone activity for a class on this topic.

Doing the activity

Before you open your bottle and pour your beverage, notice the engraving at the bottom of the glass.

Now, open the bottle, but pay attention as you do so, and explain the following observations

- Why is there a hiss when you open the cap?
- Why does a cloud form when you open the cap?

Now, pour your beverage into the glass. Pour slowly down the side to make as little foam as possible. Once things have settled, set your glass down and explain the following observations:

- Where are the bubbles forming? Why do they form here?
- As the bubbles rise, they get bigger. Why? (Note: There are 2 reasons.)
- As the bubbles rise, they get farther apart. Why?
- The glass "sweats". Where does this water come from?
- As the glass "sweats", does this tend to warm up the glass or cool it down?

Necessary materials:

- Glass, ideally with nucleation sites etched into the bottom.
- Beer or soda, ideally in a glass bottle. If the beer or soda is too dark, some of the phenomena will be hard to see.

Once you have completed your observations, please dispose of the contents of your glass in a responsible manner.

For those looking for further experimentation, here are a couple of ideas:

- If you have a dark beer, the beer is dark, but the foam is light. Why?
- If you have a nitro beer, you'll notice that, right after pouring, the bubbles on the outside of the glass move downward. What's that about?

Summing up

Thanks for a great class, folks!

For more information

Colorado State University College of Natural Sciences: http://www.natsci.colostate.edu

Little Shop of Physics: http://littleshop.physics.colostate.edu