

Cooling by Boiling [Experiment]

Due to the nature of the equipment required, in a sense, this procedure is really not an experiment, but rather a demonstration for a class to observe. It normally requires a laboratory, and cannot easily be done in a classroom.

Boiling depends both on temperature and air pressure. When you lower air pressure in the bell jar, boiling will occur. A strong pump will produce freezing of one or two grams within three or four minutes. Point out to your students that this is how freeze dried coffee is made.

Answers to the Questions

1. To say that boiling is a cooling process is to say that the process of boiling absorbs energy. The water left in the liquid state cools as energy is carried away by the steam.
2. Increase temperature; decrease surrounding air pressure.
3. The reason that applying heat to a vessel of boiling water doesn't increase its temperature is evidence that as much energy is being carried away. By what? By the vapor that leaves the liquid.