

Lab 1: Introduction to Thermal Equilibrium

by

Abstract

Sukaenah & Yarin

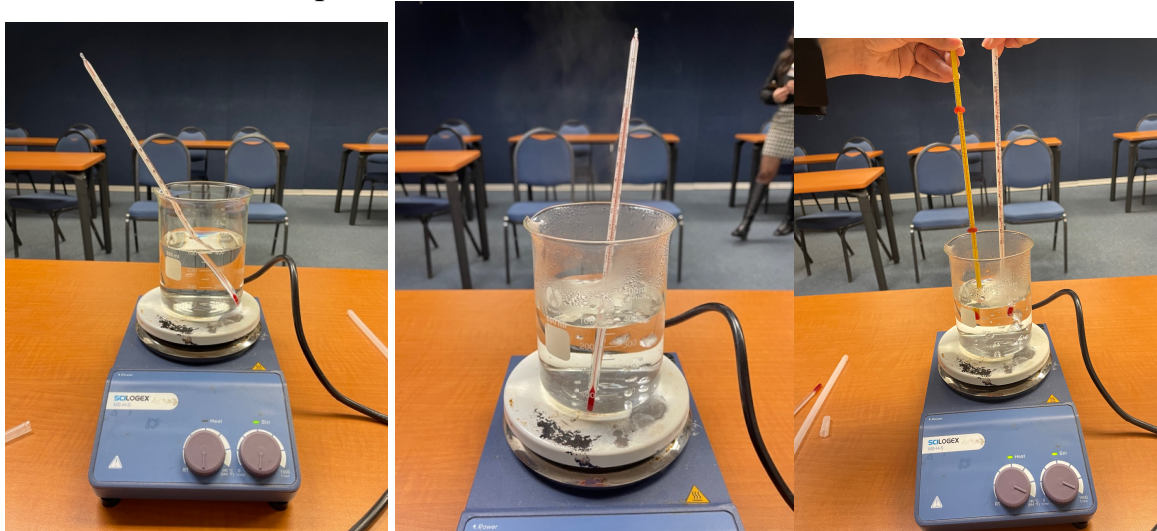
1. Objective: Introduction to energy forms

2. Introduction:

When a pot of cold water is placed on a hot burner to the cold water. When two objects at different temperatures are put in contact, heat spontaneously flows from the hotter one to the colder one. The spontaneous flow of heat is in the direction tending to equalize the temperature. If the two objects are kept in contact long enough for their temperatures to become equal, the objects are said to be in thermal equilibrium, and there are no further heat flows between them.

3. Apparatus and Materials:

Test tube, hot plate, water and a thermometer.



4. Procedure and Results:

We placed cold water on a hot burner. Water boils at 100 degrees Celsius (212 degrees Fahrenheit) under normal conditions of pressure and temperature at sea level. Once the water reaches this temperature, the heat being supplied to the water is being used to convert the water from liquid state to a gaseous state (steam), instead of increasing its temperature. As a result, the temperature of the water does not go any further above 100 degrees Celsius.

(Refer to fig.1, 2 and 3)

6. Conclusions

This experiment demonstrates the phase change from liquid water to steam, and how the heat energy being supplied to the water is being used to overcome the intermolecular bonds between the water molecules, causing them to turn into steam. When the water reaches 100 degrees Celsius, all the heat energy being supplied to the water goes towards converting it into steam, which is why the temperature of the water does not increase above 100 degrees Celsius.

7. Question:

Consider changes in temperature of water from 10°C while it is cooled down to -10°C: