

Heating Curve

Most substances can exist in three different states – a solid, a liquid and a gas state. Changes from one state to another commonly occur by heating or cooling a sample of the substance. **Melting** refers to the change of a sample from the solid to the liquid state at its melting point temperature. **Boiling** refers to the change of a sample from the liquid to the gaseous state at its boiling point temperature.

Consider a substance that is present in a sealed container in its solid state at a temperature well below its melting point. Over the course of about 15 minutes, the container is heated. At first, the application of heat causes the temperature of the substance to increase until it reaches its melting point temperature. At its melting point temperature, heat is continually added, causing the solid to transition to a liquid at a constant temperature. Once all the solid has melted, the substance is heated to its boiling point temperature. At its boiling point temperature, the addition of heat causes the liquid to transition to a gas at a constant temperature. Once all the liquid has boiled, the sample continues to be heated (cautiously), causing the temperature of the gas to increase. This process is depicted in **Figure 1**.

