

## 12.1 Phase Change and solids

**Subjects:** Properties of solids, Phase change

**Description:** The sublimation of iodine is demonstrated.

**Materials:**

250 mL Erlenmeyer flask with stopper

iodine‡

Hot plate\*

Heat gun (optional)\*

Tweezers

‡Iodine is located in the chemical storage cabinets.

\*Shared item: The hot plates are located in the top drawer in the central bench opposite the chemical storage cabinets. The heat gun is in the drawer below.

**Procedure:**

1. Place the flask on the hot plate. Turn the hot plate on to low temperature.
2. Warm the flask.
3. Iodine will sublime to iodine vapors.
4. Let the flask cool to room temperature. The iodine vapors will crystallize.

Alternatively you can heat the flask with the heat gun.

**Discussion:**

Sublimation is the process of the conversion of a solid directly to a gas. Sublimation is an endothermic process, absorbing energy like evaporation or melting. This energy is called the enthalpy of sublimation:

$\Delta_{\text{sublimation}}H = \text{energy required as heat}$

Unlike CO<sub>2</sub>, which sublimates at room temperature, iodine requires more energy in the form of heat to transform from a solid to a vapor.

**Safety:** Avoid inhaling iodine vapors and take precautions not to drop the flask with iodine.

**Disposal:** The flask with iodine can be saved and reused.

**References:**

1. J. Kotz, P. Treichel, J. Townsend; *Chemistry & Chemical Reactivity*; 7<sup>th</sup> Ed, Teachers Edition; Brooks/Cole; 2009; p. 606