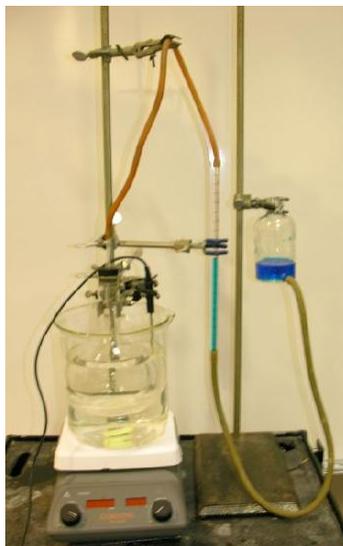


## 9.8.1: Lecture Demonstration



### Demonstration of Charles' Law

The volume of a 1 L Florence flask and rubber hose is 1125 mL (fill with water, get volume, then empty). The flask is connected to a 15 mL Pipette used as a water manometer, which in turn is connected to a leveling bulb. The flask is immersed in a 3 L low form beaker of room temperature (25°C) water, and the manometer connected, and the levelling jar adjusted so the water levels are equal and  $P_{\text{gas}} = P_{\text{atmosphere}}$ . Read the volume. About 30 g of ice is added to the water to lower the temperature a degree or two. The water levels are adjusted, and the new volume determined.

Calculate  $\Delta T/\Delta V = \sim 0.267 \text{ }^\circ\text{C/mL}$

To reach  $V = 0$ , must decrease  $1125 \text{ mL} * 0.267 \text{ }^\circ\text{C/mL} = 300 \text{ }^\circ\text{C}$

Absolute zero =  $25^\circ\text{C} - 300 = -275^\circ\text{C}$

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