Calorimetry

Calorimetry, the measurement of the transfer of energy as heat, allows chemists to determine thermal constants, such as the specific heat of metals and the enthalpy of solution.

When two substances at different temperatures touch one another, energy as heat flows from the warmer substance to the cooler substance until the two substances are at the same temperature. The amount of energy transferred is measured in joules. (One joule equals 4.184 calories.)

A device used to measure the transfer of energy as heat is a calorimeter. Calorimeters vary in construction depending on the purpose and the accuracy of the energy measurement required. No calorimeter is a perfect insulator; some energy is always lost to the surroundings as heat. Therefore, every calorimeter must be calibrated to obtain its calorimeter constant.

GENERAL SAFETY

Always wear safety goggles and a lab apron to protect your eyes and clothing. If you get a chemical in your eyes, immediately flush the chemical out at the eyewash station while calling to your teacher. Know the location of the emergency lab shower and eyewash station and the procedure for using them.

Turn off hot plates and other heat sources when not in use. Do not touch a hot plate after it has just been turned off; it is probably hotter than you think. Use tongs when handling heated containers. Never hold or touch containers with your hands while heating them.

The general setup for a calorimeter made from plastic-foam cups is shown in Figure A. The steps for constructing this setup follow.

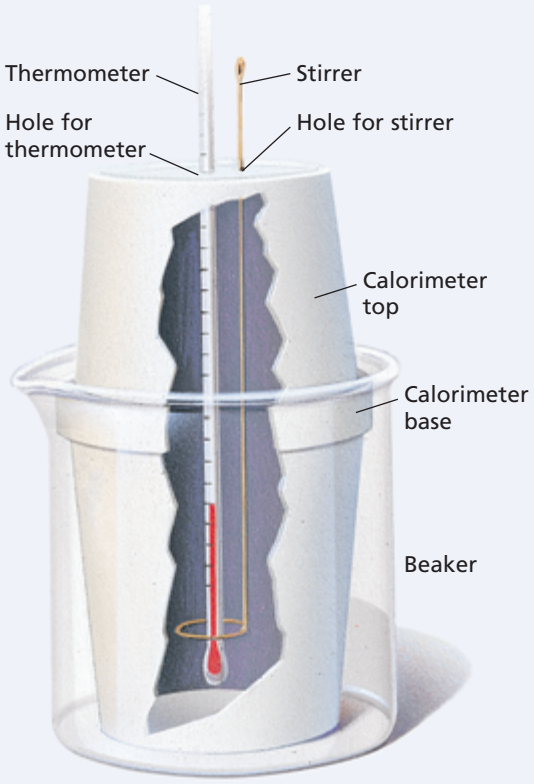

FIGURE A Position the hole for the stirrer so that the thermometer is in the center of the wire ring.