**Heat of Combustion of a Candle**

*(?Energy +?)* C25H52 + \_\_\_\_\_ O2 🡪 \_\_\_\_\_ CO2 + \_\_\_\_\_\_ H2O *(?+ Energy ?)*

**Purpose:** To determine the energy released by a burning candle and normalize it in order to apply it within a chemical equation.

**PROCEDURE:**

1. Record mass of candle/card & the mass of your empty soda can.
2. Add around 100 mL of cold (about 8-12oC below room temp) water to a can. Record the mass of the can & the water.
3. Record room temperature with thermometer.
4. Set up apparatus as instructed by your teacher.
5. Prior to lighting candle, record temperature of water in can.
6. Determine how many degrees you will raise your water to in the experiment. You are going to heat the water to a temperature as many degrees above room temperature as it was below room temperature prior to heating.
7. Light the candle and frequently stir the water with your thermometer during the reaction.
8. When goal temperature is reached, put out candle flame as gently as possible. Record final temperature (realize that the temperature may in fact continue to go up after the flame is put out.)
9. Mass candle/card after the experiment. Record. Calculate change in mass of the candle.
10. Return all materials.
11. Once your can has cooled to the point of being able to handle with your hands, dump the water and return the can.

**DATA TABLE:** Create a data table based of your procedures.

**CALCULATIONS:**

1. Determine the mass and the change in temperature for the water.
2. Determine the heat gained by the water (in joules AND kilojoules).
3. Determine the mass and moles of the candle that was burned.
4. Determine the heat lost by the candle (in joules AND kilojoules).
5. Normalize the heat lost by the candle so that it may be put into a chemical equation and be used in the mole to mole ratio. (divide the kilojoules by the number of moles)

Post Lab Questions:

1. In what way(s) did your calorimeter help control heat loss/gain? What adjustments did you make?
2. These calculations assumed that all of the joules released by the burning went completely into the water and that no extraneous joules of energy were absorbed by the water. What factors in this experiment could have invalidated those assumptions and led to errors in your experiment?
3. Write out the chemical equation in both formats.
4. Determine the percent error of your heat of combustion (retrieve the accepted value from your teacher)

**Write a conclusion based off your results. (this conclusion will be handed in separately).**