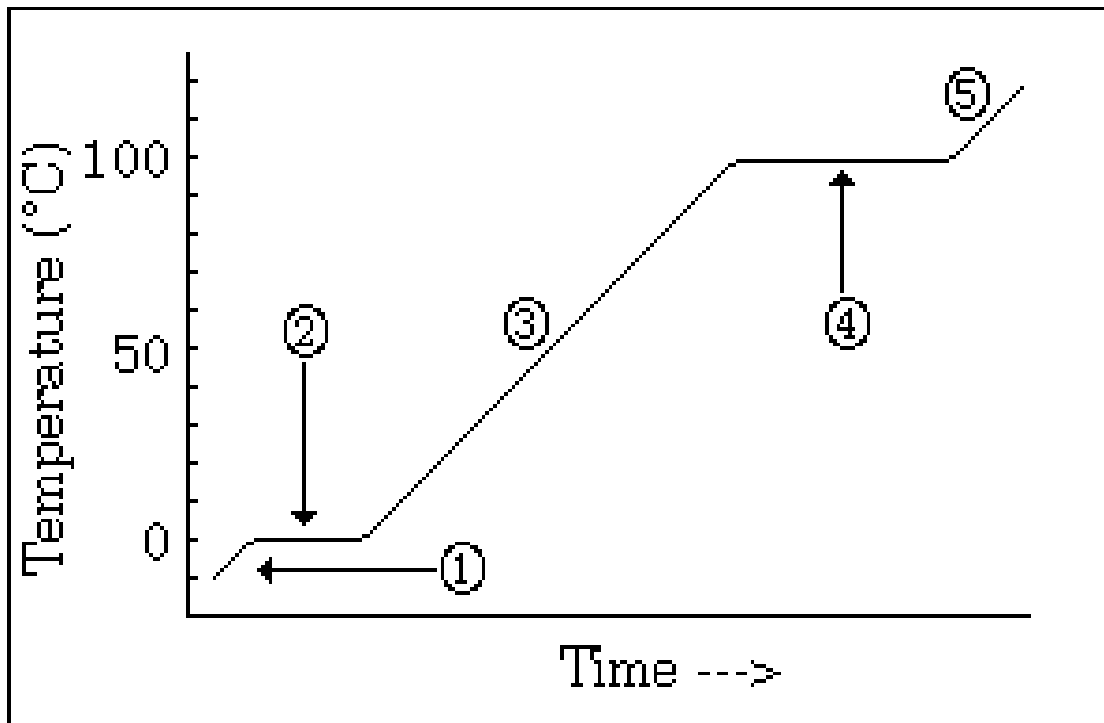


Homework 2: Show all work

1. Calculate the heat needed to raise 27.0 g of water from 10.0 °C to 90.0 °C.
2. Calculate the amount of energy used when 33.3 grams of water at 0.00 °C is heated to 50.0 °C.
3. How many joules are required to heat 200 grams of water from 25°C to 100°C?
4. How many joules are given off when 120 grams of water are cooled from 25°C to 0°C?
5. Is heat the same thing as Energy? What is the reason for your answer?

The diagram below (Heating Curve) is a plot of temperature vs. time. It represents the heating of what is initially ice at -10°C at a near constant rate of heat transfer. The phases can be solid, liquid or gas.



8) What phase or phases are present during segment (1)

b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential and/or kinetic energy)

c) What phase change, if any, is taking place?

9) What phase or phases are present during segment (2)

b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential and/or kinetic energy)

c) What phase change, if any, is taking place?

10) a) What phase or phases are present during segment (3)

b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential and/or kinetic energy)

c) What phase change, if any, is taking place?

11) a) What phase or phases are present during segment (4)

b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential and/or kinetic energy)

c) What phase change, if any, is taking place?

12) a) What phase or phases are present during segment (5)

b) What is happening to the energy being absorbed from the heat source? (answer in terms of potential and/or kinetic energy)

c) What phase change, if any, is taking place?

13) What is the melting point of this substance? _____

14) At what temperature would this sample finish boiling? _____

15) When this substance is melting, the temperature of the ice-water mixture remains constant because:

16) When a given quantity of water is heated at a constant rate, the phase change from liquid to gas takes longer than the phase change from solid to liquid because

The heat of fusion for water (ΔH_f) is 80 calories/gram and the heat of vaporization (ΔH_v) for water is 540 calories/gram.

17)

a) How much energy would be required to melt 500 grams of ice at 0°C to water at 0°C ?

b) How much energy would be required to convert 2 moles (36g) of water at 100°C to water vapor at 100°C ?

18) How many Joules of energy does a **365 Cal** donut have?

19) If the 365 Calorie donut has 55 g of carbohydrates and 11g of fat, how many grams of protein (gluten) does it contain? You will need to look up the number of calories in a gram of carbohydrate and in a gram of fat. (4 Cal = 1 g carbohydrates, 4 Cal = 1 g of protein, 9 Cal = 1 g of fat)

20) What **type** of energy does a baseball travelling at 90 mph possess?