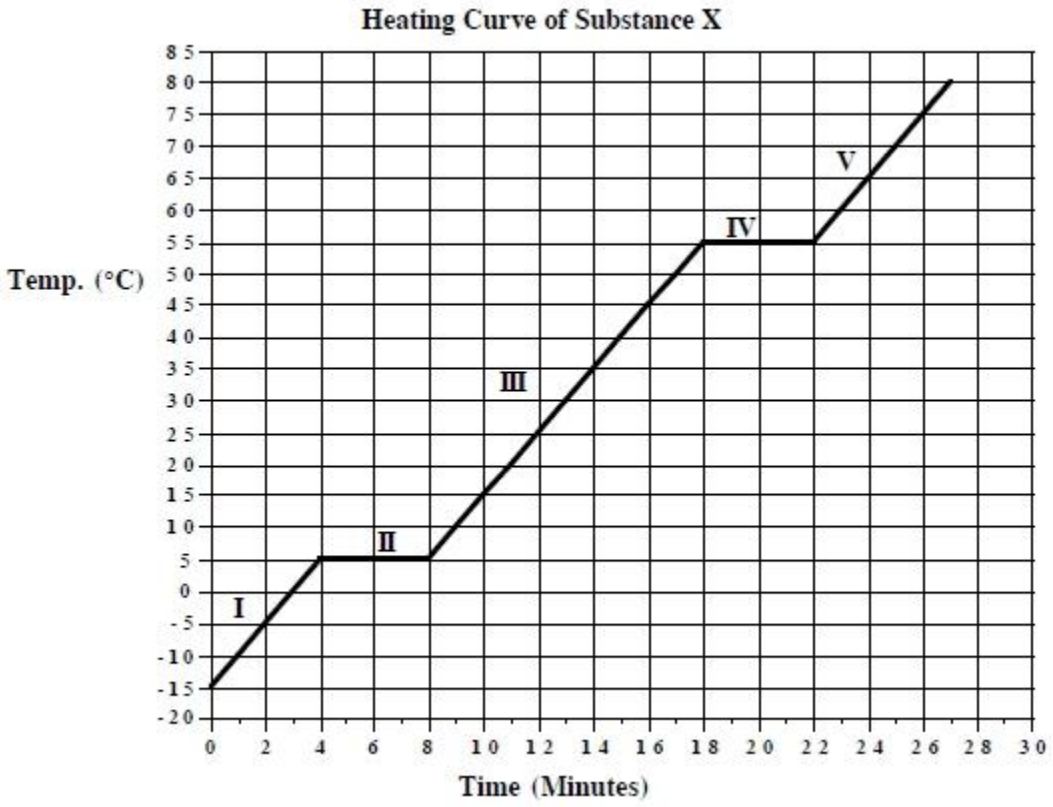
Heating Curve Worksheet 1



The heating curve shown above is a plot of temperature vs time. It represents the heating of substance X at a constant rate of heat transfer. Answer the following questions using this heating curve:

_____1. In what part of the curve would substance X have a definite shape and definite volume?

_____2. In what part of the curve would substance X have a definite volume but no definite shape?

_____3. In what part of the curve would substance X have no definite shape or volume?

_____4. What part of the curve represents a mixed solid/liquid phase of substance X?

_____5. What part of the curve represents a mixed liquid/vapor phase of substance X?

_____6. What is the melting temperature of substance X?

_____7. What is the boiling temperature of substance X?

_____8. In what part(s) of the curve would increasing kinetic energy be displayed?

_____9. In what part(s) of the curve would increasing potential energy be displayed?

_____10. In what part of the curve would the molecules of substance X be farthest apart?

_____11. In what part of the curve would the molecules of X have the lowest kinetic energy?

_____12. In what part of the curve would the molecules of X have the greatest kinetic energy?

Heating Curve Worksheet 2

Substance	Specific Heat	Substance	Specific Heat
H_2O (s)	2.06 J/g °C	Aluminum (s)	0.900 J/g °C
H_2O (g)	2.02 J/g °C	Benzene (l)	1.74 J/g °C
H_2O (l)	4.18 J/g °C	Ethanol (l)	2.42 J/g °C

Substance	Heat of Fusion	Heat of Vaporization	Boiling Points	Melting Points
H_2O	6.01 kJ/mol	40.7 kJ/mol	373.2 K	273.2 K
Benzene	10.59 kJ/mol	30.8 kJ/mol	353.2 K	278.6 K
Ethanol	4.60 kJ/mol	43.5 kJ/mol	351.5 K	158.7 K
Acetone	5.72 kJ/mol	29.1 kJ/mol	329.4 K	179 K

Substance	Molar Mass
Water (H_2O)	18.02 g/mol
Benzene (C_6H_6)	78.12 g/mol
Ethanol (C_2H_5OH)	46.08 g/mol
Acetone (CH_3COCH_3)	58.09 g/mol

Use dimensional analysis or the specific heat equation to complete the following problems.

1. How much heat is required to melt 25.0 g of ice at 0°C?

2. How much heat is required to melt 25.0 g of Benzene at 278.6 K?

3. How much heat is required to boil away 25.0 g of Ethanol at 351.5 K?

4. How much heat is required to boil away 25.0 g of Acetone at 329.4 K?

5. You have a sample of H_2O with a mass of 23.0 g at a temperature of –46.0 °C. How many kilojoules (kJ) of heat energy are necessary to:

A) heat the ice to 0°C?

B) melt the ice?

C) heat the water from 0°C to 100°C?

D) boil the water?

E) heat the steam from 100°C to 109°C?

6. How much heat is required to raise 250.0 g of ice at a temperature –15.0°C to105.0°C?

7. How much heat is required to change 25.0 g of liquid Ethanol that is at a temperature of 158.7 K to a gas at 351.5 K?