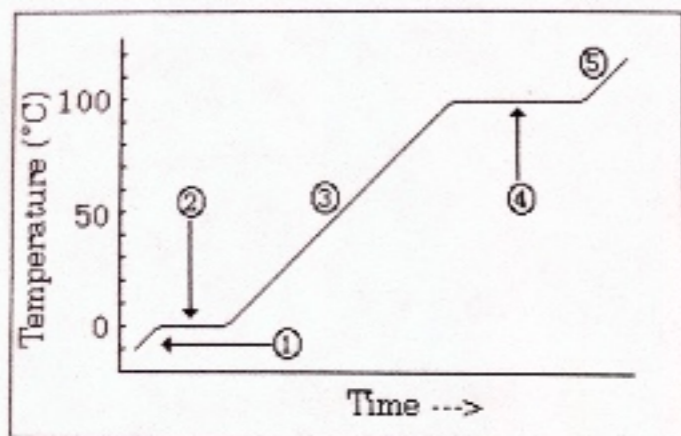


Given the idealized heating curve below answer the questions.



- 1) What is happening to the average kinetic energy of the molecules in the sample during section 2?  
*stay same*
- 2) As a substance goes through section (2), what happens to the distance between the particles?  
*increases*
- 3) What is the name of the process happening during section (4)?  
*vaporization*
- 4) What would be the name of the process happening during section (4) if time were going the other way?  
*condensation*
- 5) What is the melting point of this substance?  $0^{\circ}\text{C}$
- 6) At what temperature would this sample finish boiling?  $100^{\circ}\text{C}$
- 7) When this substance is melting, the temperature of the ice-water mixture remains constant because:
  - a. Heat is not being absorbed
  - b. The ice is colder than the water
  - c. Heat energy is being converted to potential energy
  - d. Heat energy is being converted to kinetic energy
- 8) 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
  - a. The heat of vaporization is greater than the heat of fusion
  - b. The heat of fusion is greater than the heat of vaporization
  - c. The average kinetic energy of the molecules is greater in steam than in water
  - d. Ice absorbs energy more rapidly than water does
- 9) The temperature at which a substance in the liquid state freezes is the same as the temperature at which the substance
  - a. Melts
  - b. Sublimes
  - c. Boils
  - d. Condenses
- 11) a. What are the two points used to calibrate a Celsius thermometer?  $0^{\circ}\text{C}, 100^{\circ}\text{C}$ .  
b. How is Kelvin like Celsius? How is it different?  
 $273\text{K}$ .

12)  $34^{\circ}\text{C}$  is equal to  $307\text{K}$ .

13)  $-128^{\circ}\text{C}$  is equal to  $145\text{K}$ .

15) If 150 grams of water is heated from  $20^{\circ}\text{C}$  to  $30^{\circ}\text{C}$ , the number of joules of heat energy absorbed is...

$$Q = mc\Delta T$$

$$6270\text{J}$$

16) If a 2.0 g sample of water at  $5.0^{\circ}\text{C}$  absorbs 21.8 J of heat energy, the temperature of the sample will be raised by...

$$2.6^{\circ}\text{C}$$

17) The temperature of 50.0 grams of water was raised to  $50^{\circ}\text{C}$  by the addition of 4180 J of heat energy. What was the initial temperature of the water?

$$30^{\circ}\text{C}$$

18) A sample of water is heated from  $10^{\circ}\text{C}$  to  $15^{\circ}\text{C}$  by the addition of 130 joules of heat. What is the mass of the water?

$$6.2\text{g}$$

19) How much heat is needed to warm 25 grams of water from  $10^{\circ}\text{C}$  to  $20^{\circ}\text{C}$ ?

$$1045\text{J}$$

20) How much heat is needed to warm 25 grams of water from  $-10^{\circ}\text{C}$  to  $20^{\circ}\text{C}$ ? This requires some research!

$$mc\Delta T_{\text{solid}} + mc + mc\Delta T_{\text{liq}}$$

$$(.025)(2110)(10) + (.025)(333550) + .025(4180)(20)$$

$$= 527.5 + 8338.75 + 2090$$

$$= 10956.25\text{J}$$