Heating Curves Worksheet

Refer to the heating curve in your notes for 1 mole (18 g) of water at 1 atm pressure.

1. What is the state of water at –25 °C?

2. What is the state of water at 25 °C?

3. What is the state of water at 125 °C?

4. Is heat energy released or absorbed when a solid melts?

5. Is heat energy released or absorbed when a liquid freezes?

6. How much heat energy in kJ must be added to 1 mole of ice at 0 °C to melt it into liquid water? Is this process exothermic or endothermic?

7. What is the heat energy change in kJ ($\Delta H$) when 1 mole of water at 100 °C is evaporated or boiled to produce water vapor? Is this process exothermic or endothermic?

8. What is the heat energy change in kJ ($\Delta H$) when 1 mole of water vapor is condensed to liquid water at 100 °C? Is this process exothermic or endothermic?

9. What is the heat energy change ($\Delta H$) when 1 mole of water is frozen into ice at 0 °C? Is this process exothermic or endothermic?

10. What is the heat of vaporization of water?

11. What is the heat of fusion of water?

12. What is the heat energy change when 2 moles of ice is melted at 0 °C?

13. What is the heat energy change when 50. g of water is frozen at 0 °C?

14. What is the heat energy change when 50. g of water is boiled at 100 °C to produce water vapor?

15. The heat of vaporization of butane ($C_4H_{10}$) is 22.4 kJ/mole. How much heat energy is required to vaporize 100. g of butane?

16. What is the heat energy change in kJ when 50. g of liquid water is heated from 0 °C to 100 °C?

17. What is the heat energy change in kJ when 1 mole of liquid water is heated from 0 °C to 100 °C?

18. What is the heat energy change when 1 mole of liquid water is heated from 0 °C to 100 °C and boiled to produce water vapor?

19. What is the heat energy change when 1 mole of ice is heated from –25 °C to 125 °C and converted into water vapor?