

TRANSPARENCY 38

ENTHALPY OF FUSION AND VAPORIZATION

1. What is meant by the term "enthalpy of fusion," which appears at the top of the transparency?
Heat to melt 1 gram of a substance
2. What is meant by the term "enthalpy of vaporization"?
Heat to boil 1 gram of a substance
3. What does the symbol q represent?
Heat
4. Which line in the graph (a, b, c, d, or e) represents the warming of ice to its melting point?
(a)
5. Which line in the graph represents the heating of liquid water to its boiling point?
(c)
6. Which line in the graph represents the amount of heat required to melt the ice once it has reached its melting point?
(b)
7. Which line in the graph represents the amount of heat required to vaporize the liquid water once it has reached its boiling point?
(d)

8. Given the equation

$$q = \text{mass} \times \text{enthalpy of fusion}$$

calculate the amount of heat required to melt 100.g of ice, if the enthalpy of fusion of ice is 334 J/g. Compare your answer with the heat change represented by line (b) of the graph.

$$\frac{100.g}{g} \times 334 J = 33400 J \quad \text{close} \quad 35.5 kJ$$

9. Given the equation

$$q = \text{mass} \times \text{enthalpy of vaporization}$$

calculate the amount of heat required to vaporize 100.g of liquid water, if the enthalpy of vaporization is 2260 J/g. Compare your answer with the heat change represented by line (d) of the graph.

$$\frac{100.g}{g} \times 2260 J = 226,000 J \quad \text{close} \quad 250 kJ$$

10. Using the graph, estimate how much heat is required to convert 100, grams of ice at -50°C to steam at 150°C .

$$321 kJ$$

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