

## HEAT CALCULATIONS PRACTICE HC ANSWERS

- 1) How much heat is required to completely melt 75.0 g of ice at 273 K?

$$Q = mH_f \quad x = (75.0 \text{ g})(334 \text{ J/g}) \\ X = 25050 \text{ J} \rightarrow 25100 \text{ J}$$

- 2) How much heat is required to completely vaporize a 65.4 g sample of liquid water is initially at 86.6°C to steam at 100.°C?

$$Q = mC\Delta T \quad \text{and} \quad Q = mH_v \\ (65.4)(4.18)(13.4) + (65.4)(2260) \\ 3663.1848 \quad + \quad 147804 = 151467.18 \rightarrow 151000 \text{ J}$$

- 3) An unknown substance has a heat of vaporization of 3500 J/g. If a sample of that substance requires 85670 J to vaporize completely, what is the mass of the sample?

$$Q = mH_v \quad 85670 \text{ J} = (x) (3500 \text{ J/g}) \\ X = 24.477 \rightarrow 24 \text{ g}$$

- 4) How much heat is released when 9.54 g of water cools from 78.9°C to 34.8°C?

$$Q = mC\Delta T \\ X = (9.54 \text{ g}) (4.18 \text{ J/gC})(-44.1^\circ\text{C}) \\ X = 1758.58 \rightarrow 1760 \text{ J}$$

- 5) How much heat is required to completely melt 12.5g of ice at 0.0°C to liquid water at 18.5°C?

$$Q = mH_f \quad \text{and} \quad Q = mC\Delta T \\ (12.5)(334) \quad + \quad (12.5)(4.18)(18.5) \\ 4175 \quad + \quad 966.625 = 5141.625 \rightarrow 5100 \text{ J}$$