PQ 5 SHC LH Calculations

Q

Q1

- Western Power sell electricity by the kWh, where 1 kWh = 3.6106 J. Suppose that it costs $0.08 per kWh to run an electric water heater in your neighbourhood. How much does it cost to heat 75 kg of water from 15°C to 43°C to fill a bathtub?

Q2

A 2.00×10^2-g sample of water at 80.0°C is mixed with 2.00×10^2 g of water at 10.0°C. Assume that there is no heat loss to the surroundings. What is the final temperature of the mixture?

Q3

Three lead fishing weights, each with a mass of 1.00×10^2 g and at a temperature of 100.0°C, are placed in 1.00×10^2 g of water at 35.0°C. The final temperature of the mixture is 45.0°C. What is the specific heat of the lead in the weights?

Q4

A 1.00×10^2-g aluminum block at 100.0°C is placed in 1.00×10^2 g of water at 10.0°C. The final temperature of the mixture is 25.0°C. What is the specific heat of the aluminum?

Q5

How much heat is absorbed by 1.00×10^2 g of ice at $-20.0°C$ to become water at $0.0°C$?

Q6

A 2.00×10^2-g sample of water at 60.0°C is heated to steam at 140.0°C. How much heat is absorbed?

Q7

How much heat is needed to change 3.00×10^2 g of ice at $-30.0°C$ to steam at $130.0°C$?

Q8

- How much heat is needed to change 50.0 g of water at 80.0°C to steam at 110.0°C?

Q9

- The specific heat of mercury is 140 J/kg°C. Its heat of vaporisation is 3.06105 J/kg. How much energy is needed to heat 1.0 kg of mercury metal from 10.0°C to its boiling point and vaporise it completely? The boiling point of mercury is 357°C.

Q10

- A 10.0-kg piece of zinc (c= 388 J/kg K) at 71.0°C is placed in a container of water, The water has a mass of 20.0 kg and a temperature of 10.0°C before the zinc is added. What is the final temperature of the water and the zinc?