PQ 10 Heat

Q

Q1

- How much heat energy is needed to raise the temperature of 3 kg of copper by 6 K?
- (Specific heat capacity of copper = 385 J/(kg K)

Q2

- What is the rise in temperature of 5 kg of water if it is given 84 000 J of heat energy?
- Specific heat capacity of water = 4200 J/(kg K).

Q3

- How much heat is lost by 3 kg of lead when it cools from 1000 oC to 200 oC?
- Specifc heat capacity of lead = 126 J/(kg K)

Q4

- A heater of 800W is use to heat a 600 g cast iron cooker plate.
- How long will it take to raise the temperature of the plate by 200 oC?
- Specific heat capacity of iron = 500 J/(kg K)

Q5

- Find the energy needed to change 4 kg of water at 100oC into steam at 100oC.
- Specific latent heat of vaporisation of water = 2 260 000 J/kg.

Q6

- Find the energy needed to change 500 g of ice at 0oC to water at 0oC. Specific latent heat of fusion of water = 334 000 J/kg.

Q7

- Calculate the mass of water that will be turned to steam if a kettle is left boiling (at 100oC) for 5 minutes. Will the kettle boil dry?
- 1 litre of water
- Power of kettle = 2 kW
- Time of boiling = 5 mins = 600s
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Q8

- A 2 kg lump of cast iron at 90oC in put into a plastic bucket containing 10 kg of water at 20oC. What is the final temperature of the water and iron (you can ignore the heat energy absorbed by the bucket and assume that no heat energy is lost to the surroundings.)

- Specific heat capacity of water = 4200 J/(kg K).
- Specific heat capacity of cast iron = 500 J/(kg K)

Q9

- A 2kg block of iron is given 10kJ of energy and its temperature rises by 10˚C. What is the specific heat capacity of iron?

Q10

- An electrical immersion heater supplies heat at a steady rate to 2.5 kg of water at 20°C in a container of thermal capacity 1500 J/K and it is noticed that in 8.0 minutes the temperature of the water rose to 100°C.

- After another hour, the water was just boiled away.

- (a) Calculate the rate at which energy is supplied by the heater.

- (Specific heat capacity of water = 4200 J/kg K)