PQ 2 Heat

Questions

Q

PQ1

- Specific heat capacity of aluminium = 910 J kg^{-1} K^{-1}.
- How much heat energy is needed to heat 4 kg of aluminium by 8 ^{o}C?

PQ2

- If 48 000 J of heat energy are given off when a 2 kg block of metal cools by 12 ^{o}C, what is the specific heat capacity of the metal?

PQ3

- A 50 W heater is used to heat, an aluminium block with a mass of 5 kg. After 10 minutes the temperature of the block has risen by 4 ^{o}C. Calculate:
- (a)the heat given out by the heater;
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- (b) the specific heat capacity of aluminium.
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- (c)Why is your answer different from the correct value given in the data above?

PQ4

- How much heat energy is given out when 3 kg of water at 40 ^{o}C cool to 25 ^{o}C?

PQ5

- How much heat energy is given out when 500 g of steam at 100 ^{o}C condenses and then cools to 50 ^{o}C?

PQ6

- Why is a scald by steam at 100 ^{o}C much more painful than one by water at 100 ^{o}C?

PQ7

- How long will it take a 50 W heater to melt 2 kg of ice at 0 ^{o}C?

PQ8

- Calculate the amount of heat required to completely convert 50 g of ice at 0 ºC to steam at 100 ºC. The specific heat capacity of water is 4.18 kJ.kg-1.K-1. The specific latent heat of fusion of ice is 334 kJ.kg-1, and the specific heat of vaporization of water is 2260 kJ.kg-1.

PQ9

- *The heater in an electric kettle delivers 1.5 kW of power to 2 kg of water at its boiling point. The specific latent heat of vaporisation of water is 2.26 x 10^6 J/kg.*
- *(a) How much energy would be needed to boil off 1 kg of the water?*
- *(b) The kettle is switched on for 100 s.*
- *(i) How much heat energy is delivered to the water in this time.*
- *(ii) How much steam is produced in 100 s?*