AQA Physics GCSE
RP01 - Specific Heat Capacity

Flashcards

Define the 'Specific Heat Capacity' of a substance.

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The amount of energy needed to raise the temperature of 1 kilogram of a substance by 1 degree Celsius.

State the units for Specific Heat Capacity.

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J/°C/kg

Joules/Degree Celsius/Kilogram

State the equation used to calculate the temperature change when a substance is heated. Give appropriate units.

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- $\Delta E = m \, c \, \Delta\theta$

- Energy (J), Mass (kg), Specific Heat Capacity (J/kg/°C), Temperature (°C)

If the power of the heater being used isn't given, how can you calculate it?

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By connecting it in parallel with a voltmeter, and in series with an ammeter, and then applying the equation:

P = I x V

Why do the metal blocks used in the experiment have two holes in them?

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One for is for the heater and one is for the thermometer.

What can be done to improve the reading given by the thermometer?

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Add a few drops of water in the hole with the thermometer to improve the thermal contact and ensure even heating.

What reading do you record during the experiment and how frequently?

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You record the temperature value every 10 minutes from when the heater is inserted and switched on.

What graph do you plot with the data?

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A graph of temperature against work done by the heater.

How do you calculate the work done by the heater?

How do you calculate the work done by the heater?

Using the equation:

Energy = Power of heater x Time

Where energy is equivalent to the work done.

Once the block has initially warmed up, describe the graph of temperature against work done by the heater that should be obtained.

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It should be a linear relationship and so should produce a straight line.

If you start timing from when you switch on the heater, why may the graph not initially be linear?

If you start timing from when you switch on the heater, why may the graph not initially be linear?

There will initially be some thermal inertia whilst the block and heater warm up.

What does the gradient of the graph represent?

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The inverse of the heat capacity for the metal block.

How do you obtain the specific heat capacity for the metal you are measuring?

How do you obtain the specific heat capacity for the metal you are measuring?

Divide the inverse of the gradient by the mass of the metal block used.

What is the difference between heat capacity and specific heat capacity?

What is the difference between heat capacity and specific heat capacity?

Specific heat capacity is the heat capacity measured for a mass of 1 kg.

Why should you wrap insulation around the outside of the metal block?

Why should you wrap insulation around the outside of the metal block?

To reduce the heat loss to the environment and ensure the temperature reading is as accurate as possible.

What safety precautions should be taken when carrying out this experiment?

What safety precautions should be taken when carrying out this experiment?

- Avoid touching the metal
- Use a heatproof mat
- Avoid spilling water near the power supply when adding drops to the thermometer hole