WJEC England A-Level Physics
1.8 Thermal Physics
Flashcards

What is absolute zero?

What is absolute zero?

- 273℃

Where objects have no/minimum kinetic energy.

What is internal energy?

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The sum of the potential and kinetic energies of a system.

If the internal energy of an ideal monatomic gas is wholly kinetic, then what is the equation for U?

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If the internal energy of an ideal monatomic gas is wholly kinetic then:

$$U = \frac{3}{2} nRT$$

What is heat?

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Heat is the flow of energy from a hotter region to a cooler region due to the difference in temperature. In thermodynamics this is heat entering or leaving a system.

What is thermal equilibrium?

What is thermal equilibrium?

Heat can enter or leave a system through a system's boundary. Any 2 systems that are in contact with one another and that have no flow of heat between each other, must be in thermal equilibrium. This means they will be at the same temperature.

How can you increase the thermal energy of a system?

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We can increase it by heating it up or doing work on the object.

Explain the energy changes that occur during a change of state.

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During a change of state the potential energy of the particles change but the kinetic energy doesn't change.

What equation can be used to determine the energy required to change the temperature of a substance?

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$$Q = mc\Delta T$$

Q: J

m: kg

c: JK⁻¹

T: K

Give the equation to work out the energy required for a change of state.

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$$Q = ml$$

Q: J

m: kg

l: Jkg^{-1}

Give the equation that relates work and pressure and explain this in relation to the p-V graph.

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$$W = p\Delta V$$

In a cylinder with a piston, the gas has work $p\Delta V$ when a pressure p is exerted to push the piston increasing the volume by ΔV.

For a change in p the work is the area under the $p - V$ graph.

What is the first law of thermodynamics?

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$$\Delta U = Q - W$$

Where Q = the heat added to a system

And W is the work done by the system

What is the specific heat capacity of substance?

What is the specific heat capacity of substance?

The energy required to raise the temperature of 1kg of a substance by 1K.

What is the specific latent heat of a substance?

What is the specific latent heat of a substance?

The energy required to change the state of a unit mass of a substance, whilst keeping the temperature constant.

What is the internal energy of an ideal gas equal to?

What is the internal energy of an ideal gas equal to?

It is equal to the kinetic energy of the gas. This is because an ideal gas assumes that there are no intermolecular forces and so there is no potential energy.

What is Boyle's law?

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Pressure is inversely proportional to volume, providing temperature is constant.