AQA Physics GCSE

4.3.3 - Particle Model and Pressure

Flashcards

Describe the motion of molecules in a gas.

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They are in constant random motion.

What factor affects the average kinetic energy of gas molecules?

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- The temperature of the substance
- The higher the temperature, the higher the **average** kinetic energy of the molecules

What effect does increasing temperature have on the pressure of a gas when held at constant volume?

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Pressure of the gas will increase as the temperature increases.

Why does pressure increase as temperature increases (at a constant volume)?

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- Kinetic energy of molecules increases
- Collisions between molecules becomes more frequent
- Greater rate of change of momentum
- Greater force and therefore pressure

If gas A is at a low pressure, and gas B is at a high pressure, what can be said about the rate of collisions in each gas?

If gas A is at a low pressure, and gas B is at a high pressure, what can be said about the rate of collisions in each gas?

- There are more collisions per second in gas B than in gas A
- The rate of collisions is higher in B

Describe the force that the pressure of a gas exerts on the walls of its container.

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- The net force acts at right-angles to the container's surface
- The force increases as pressure increases

Explain how increasing the volume of a gas results in a decrease of pressure.

Explain how increasing the volume of a gas results in a decrease of pressure.

- Molecules become more spread out and so time between collisions increases
- This reduces the rate of collisions
- Rate of change of momentum decreases, and so force exerted on container decreases, resulting in a lower pressure

What can be said about the product of pressure and volume for a fixed mass of gas at a constant temperature? (Higher)

What can be said about the product of pressure and volume for a fixed mass of gas at a constant temperature?

It is constant.

$p V = \text{constant}$

What is the unit used for pressure?

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Pascal (Pa)

What increases when you do work on a gas?

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- The internal energy of the gas
- This can also lead to an increase of temperature

Why does the temperature of air inside a bike pump increase when it is pumped?

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- Work is done on a gas when it is compressed
- Doing work on a gas increases its internal energy, so also increases the average kinetic energy of the molecules
- Temperature increases with an increase of average kinetic energy