Ideal gases

A-Level Physics · Vocabulary in context

Word	Example
mole /məʊl/	One **mole** of carbon has a mass of 12 g. 12 g
amount of substance /əˈmaʊnt ɒv ˈsʌbstəns/	The **amount of substance** is measured in moles.
kelvin /ˈkelvɪn/	Water freezes at 273 **kelvin**. 273
Avogadro constant /ˌævəˈgædrəʊ ˈkɒnstənt/	The **Avogadro constant** is the number of particles in one mole.
atom /ˈætəm/	An **atom** has a nucleus and electrons.
monatomic /ˌmɒnəˈtɒmɪk/	Helium is a **monatomic** gas: its particles are single atoms.
molecule /ˈmɒlɪkjuːl/	A water **molecule** has two hydrogen atoms and one oxygen atom.
molar mass /ˈməʊlə mæs/	The **molar mass** of water is 18 g/mol. 18 g/mol
equation of state /ɪˈkweɪʒn ɒv steɪt/	pV = nRT is the **equation of state** for an ideal gas. pV = nRT
ideal gas /aɪˈdɪəl gæs/	An **ideal gas** follows pV = nRT exactly. pV = nRT
pressure /ˈpreʃə/	A sharp knife puts a large **pressure** on the bread.
thermodynamic temperature /ˌθɜːməʊdaɪˈnæmɪk ˈtemprɪtʃə/	**Thermodynamic temperature** starts at absolute zero.

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volume /'vɒlju:m/	The **volume** of the box is $2\ \text{m} \times 1\ \text{m} \times 1\ \text{m} = 2\ \text{m}^3$. $2\ \text{m} \times 1\ \text{m} \times 1\ \text{m} = 2\ \text{m}^3$
molar gas constant /'məʊlə gæs 'kɒnstənt/	R is the **molar gas constant**. R
Boltzmann constant /'bɒltsmən 'kɒnstənt/	k is the **Boltzmann constant**. k
mean-square speed /mi:n skweə spi:d/	Square each speed, then take the average: this is the **mean-square speed**.
internal energy /ɪn'tɜ:nl 'enədʒi/	Heating the gas raises its **internal energy**.
Boyle's law /bɔɪlz lɔ:/	**Boyle's law** says pressure doubles when the volume halves.
Charles's law /'tʃɑ:lzɪz lɔ:/	**Charles's law** says a gas expands when it gets hotter.
pressure law /'preʃə lɔ:/	The **pressure law** says pressure rises with temperature.
kinetic theory /kɪ'netɪk 'θɪəri/	**Kinetic theory** says gas particles move all the time.
random motion /'rændəm 'məʊʃn/	Smoke particles show **random motion**.
intermolecular /ˌɪntəmə'lekjʊlə/	**Intermolecular** forces hold the water molecules together.
elastic collision /ɪ'læstɪk kə'lɪʒn/	In an **elastic collision**, no kinetic energy is lost.
kinetic energy /kɪ'netɪk 'enədʒi/	A fast car has a lot of **kinetic energy**.
momentum /məʊ'mentəm/	A heavy truck has a lot of **momentum**.

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impulse /ˈɪmpʌls/	A kick gives the ball an **impulse**.
mean square /miːn skweə/	Take the **mean square** of the speeds.
root-mean-square /ruːt miːn skweə/	The **root-mean-square** speed is the square root of the mean-square speed.
average translational kinetic energy /ˈævrɪdʒ træn'sleɪʃənl kɪ'netɪk 'enədʒi/	Hotter gas particles have more **average translational kinetic energy**.
translational kinetic energy /træn'sleɪʃənl kɪ'netɪk 'enədʒi/	A moving particle has **translational kinetic energy**.

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