

1 Gases and diffusion – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
gas	气体	_____
pressure	压强	_____
kinetic energy	动能	_____
Diffusion	扩散	_____
concentration	浓度	_____
relative molecular mass	相对分子质量	_____

Recall

From Part 1 you know a **gas** 气体 is far-apart, fast-moving particles. Here we see how a gas responds to **heat** and **pressure**, and how particles **spread out** by diffusion.

- Gas particles hit the container walls —this is **pressure** 压强.
- Particles spread from crowded to spread-out places.

Nothing here is hard —it just follows the particles.

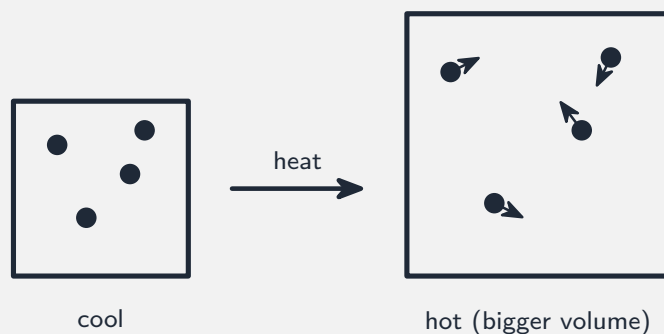
New ideas

Read these first, then do the Practice.

■ 1 Heating a gas

Heating gives the particles more **kinetic energy** 动能, so they move faster and hit the walls harder and more often:

- at **constant pressure** → the gas takes up **more space** (volume increases).
- at **constant volume** (a sealed rigid container) → the **pressure rises**.



■ 2 Squeezing a gas

Increasing the **pressure** at constant temperature pushes the particles closer, so the **volume decreases**.

■ 3 Diffusion

Diffusion 扩散 is the spreading of particles from high **concentration** 浓度 to low concentration, because particles move randomly. It happens in gases and liquids, not solids.

Lighter particles move faster, so a gas with a smaller **relative molecular mass** 相对分子质量 diffuses faster.



Watch out: when heating a gas, say what is fixed—in a *sealed rigid* container the pressure rises (volume fixed); at *constant pressure* the volume rises instead. In diffusion the **lighter** gas (smaller M_r) always travels faster.

Practice

Try these in order.

1.1 What causes the pressure of a gas on its container?

[1]

1.2 A gas in a sealed rigid container is heated. Explain why its pressure rises. [2]

1.3 What is *diffusion*? [1]

1.4 Why does diffusion happen in gases and liquids but not in solids? [1]

1.5 Ammonia ($M_r = 17$) and hydrogen chloride ($M_r = 36.5$) diffuse from opposite ends of a tube. Which travels further, and why? [2]

1.6 Challenge. Two gases, X ($M_r = 2$) and Y ($M_r = 32$), are released together from the same place. Which spreads through the room faster, and why? [2]