

3.1 Diffusion

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS diffusion 扩散 • concentration 浓度 • ions 离子 • temperature 温度
• particles 粒子

Objective

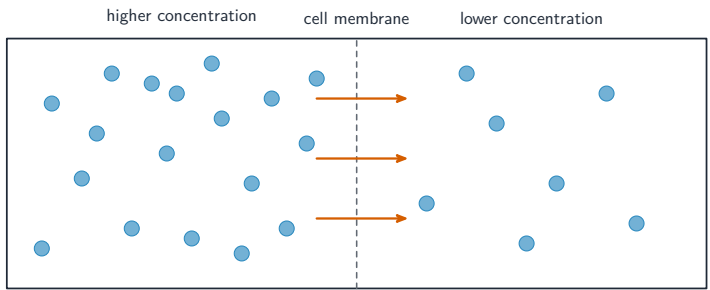
Build the skills to answer exam questions on **diffusion** 扩散 — the definition, why no energy is needed, and the factors affecting its rate.

You must be able to:

- define diffusion (net movement down a concentration gradient)
- state where the energy comes from
- give the factors that affect the rate of diffusion

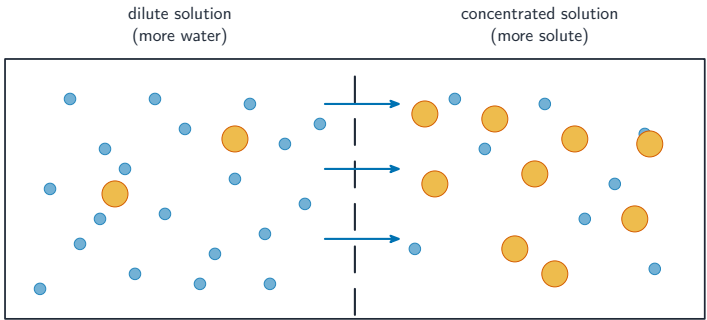
1 Worked examples

■ Diffusion



net movement of particles down the concentration gradient

Diffusion: net movement of particles from higher to lower concentration (down the gradient)



water moves by osmosis to the concentrated side; solute is too big to cross

Osmosis is the diffusion of water across a membrane

- **no extra energy** — uses the particles' own random (kinetic) movement.
- **faster when:** larger surface area, higher temperature, steeper gradient, shorter distance.
- e.g. O₂ diffuses into cells, CO₂ diffuses out.

2 Practice

2.1 Define diffusion. [2]

2.2 State where the energy for diffusion comes from. [1]

3 Exam-style questions

3.1 Diffusion is faster when the temperature is: [1]

- **A** lower
- **B** higher
- **C** at freezing point
- **D** it has no effect

3.2 Oxygen moves from the air in the alveoli into the blood.

(a) Name the process. [1]

(b) State two factors that would increase the rate of this movement. [2]

3.3 Explain why diffusion does not require energy from respiration. [2]

Solutions

2.1 the net movement of particles from a region of higher concentration to a region of lower concentration, down a concentration gradient.

2.2 the kinetic energy of the random movement of the particles.

3.1 B. Higher temperature makes particles move faster, so diffusion is faster.

3.2 (a) diffusion.

(b) any two of: larger surface area; higher temperature; steeper concentration gradient; shorter distance.

3.3 the particles move using their own random (kinetic) energy; so no extra energy from respiration is needed.