

1.2 Diffusion

Name: _____ Class: _____ Date: _____

Total: 8 marks

KEY WORDS diffusion • relative molecular mass • rate • particles
• mass

Objective

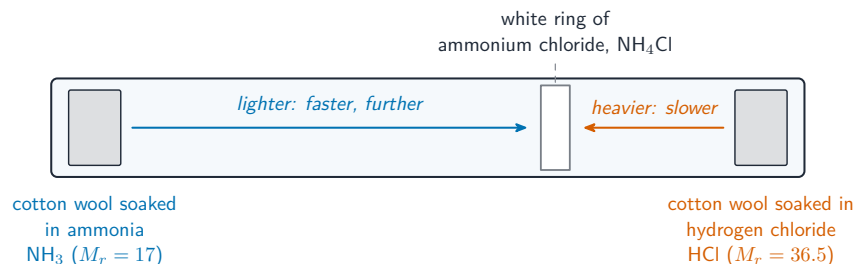
Build the skills to answer exam questions on **diffusion** – what it is, why it happens, and how the **rate** depends on **relative molecular mass**.

You must be able to:

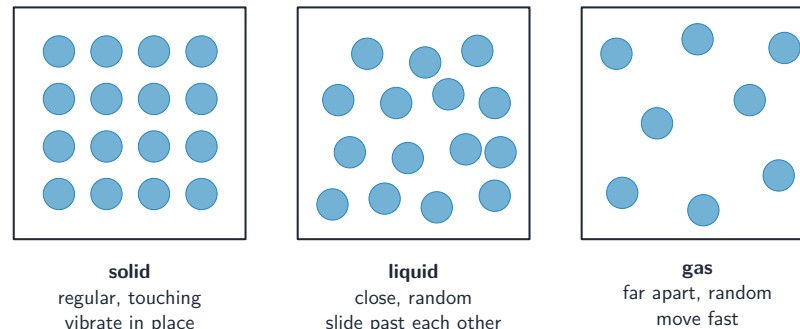
- describe diffusion as spreading from high to low concentration
- explain diffusion using the random motion of particles
- explain why lighter molecules diffuse faster (the NH_3/HCl experiment)

1 Key knowledge and worked examples

■ The NH_3/HCl experiment



Ammonia ($M_r = 17$) is lighter, so it diffuses faster and further; the ring forms nearer HCl



Diffusion is the random movement of particles

- diffusion:** net spreading from higher to lower concentration, caused by random particle motion.
- happens in gases and liquids, **not** solids (particles can't move from place to place).
- at the same temperature, molecules with smaller M_r diffuse **faster**.

2 Practice

2.1 Define diffusion. [1]

2.2 State why diffusion does not occur in solids. [1]

3 Exam-style questions

3.1 Two gases diffuse along a tube. The one that travels faster has the: [1]

- ☐ A larger relative molecular mass
- ☐ B smaller relative molecular mass
- ☐ C higher density
- ☐ D larger molecules

3.2 In the experiment, ammonia ($M_r = 17$) and hydrogen chloride ($M_r = 36.5$) diffuse from opposite ends of a tube and form a white ring.

(a) State, with a reason, at which end the white ring forms nearer. [2]

(b) Name the white solid formed. [1]

3.3 Explain, in terms of particles, why you can smell perfume from across a room. [2]
