

12.1 Experimental design

Name: _____ Class: _____ Date: _____

Total: 7 marks

KEY WORDS apparatus • measuring cylinder • burette • stop-watch
• solution

Objective

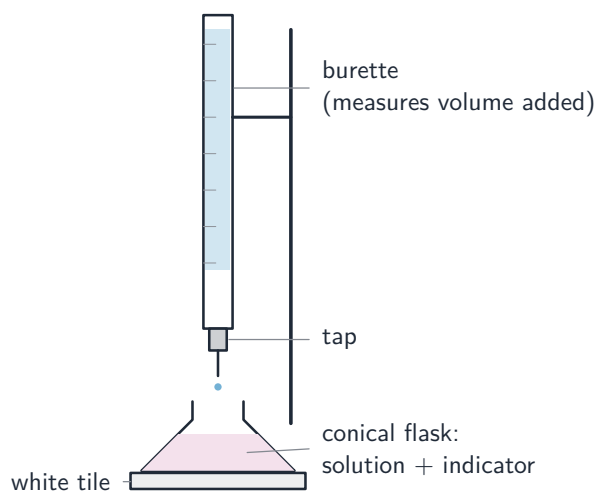
Build the skills to answer exam questions on **experimental design** – choosing **apparatus** for each measurement and the key practical words.

You must be able to:

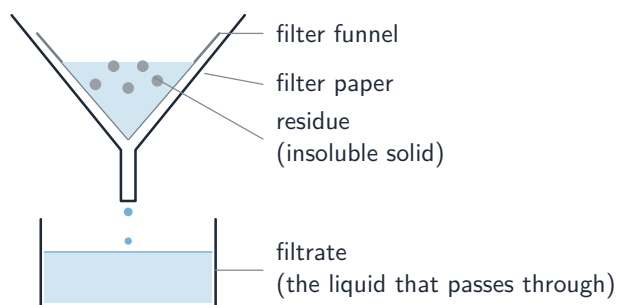
- choose the right apparatus for measuring time, temperature, mass and volume
- define solvent, solute, solution, saturated solution, residue, filtrate
- describe accurate vs rough volume measurement

1 Key knowledge and worked examples

■ Apparatus and key words



Accurate volume: burette/pipette; rough volume: measuring cylinder; gas volume: gas syringe



Filtration is a core separation technique

- **solvent** dissolves the **solute** to make a **solution**; **saturated** = max dissolved.
- **residue** = solid left behind; **filtrate** = liquid that passes through a filter.

2 Practice

2.1 Name the apparatus used to measure an accurate volume of a solution. [1]

2.2 Define a saturated solution. [1]

3 Exam-style questions

3.1 Which apparatus measures the volume of a gas produced? [1]

- ☐ A thermometer
B balance
C gas syringe
D stop-watch

3.2 A student needs to measure exactly 25.0 cm^3 of acid and the temperature of a reaction.

(a) Name the apparatus for each. [2]

(b) State the difference between a residue and a filtrate. [2]
