

Exercise walk-through

Experimental design ■ 12.1

eXercise

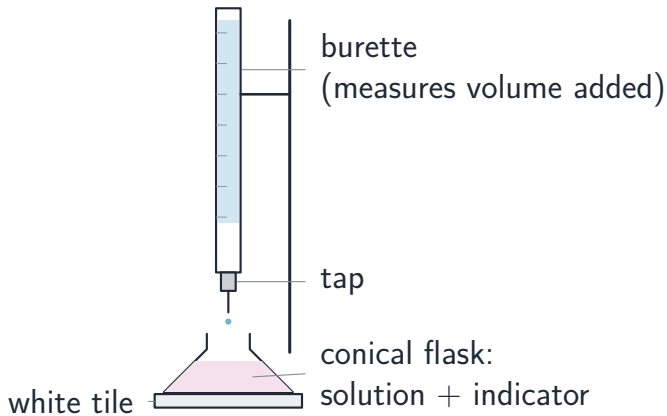
You must be able to

- 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

Method — Apparatus and key words

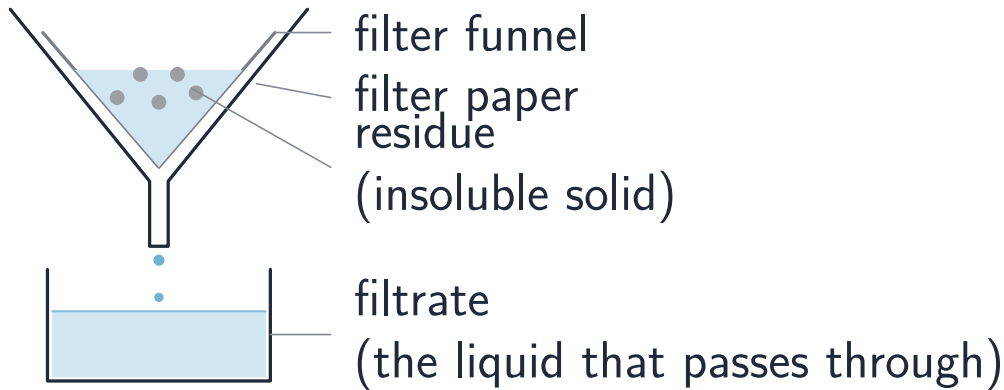
- **solvent** dissolves the **solute** to make a **solution**; **saturated** = max dissolved.
- **residue** = solid left behind; **filtrate** = liquid that passes through a filter.

Method — Apparatus and key words



A burette above a conical flask — accurate volume measurement

Method — Apparatus and key words



Filtration is a core separation technique

Practice 2.1 ■ 1 mark

Name the apparatus used to measure an accurate volume of a solution.

Solution 2.1

Method: Apparatus and key words

Worked steps

a burette or a (volumetric) pipette **B1**.

Practice 2.2 ■ 1 mark

Define a saturated solution.

Solution 2.2

Method: Apparatus and key words

Worked steps

a solution holding the maximum amount of solute that will dissolve at that temperature **B1**.

Exam-style 3.1 ■ 1 mark

Which apparatus measures the volume of a gas produced?

A thermometer

B balance

C gas syringe

D stop-watch

Solution 3.1

Method: Apparatus and key words

A thermometer

B balance

C gas syringe



D stop-watch

Worked steps

C. A gas syringe measures the volume of gas produced.

Exam-style 3.2 ■ 2 marks

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

- (a) Name the apparatus for each.
- (b) State the difference between a residue and a filtrate.

Solution 3.2

Method: Apparatus and key words

Worked steps

- (a) a pipette (or burette) for the acid; a thermometer for the temperature **B1** **B1**.
- (b) the residue is the solid left behind on the filter; the filtrate is the liquid that passes through **B1** **B1**.