

Chem!stry

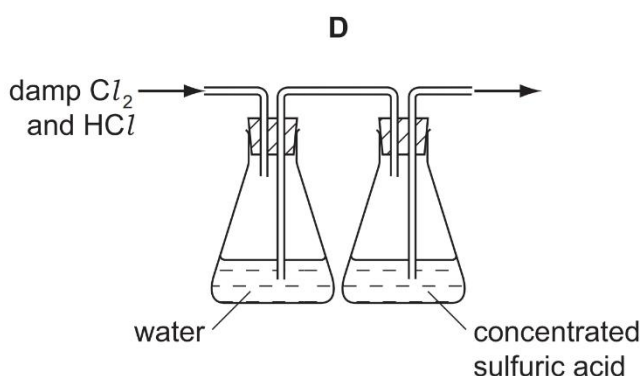
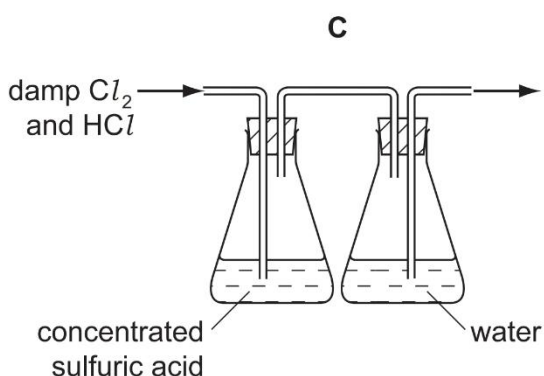
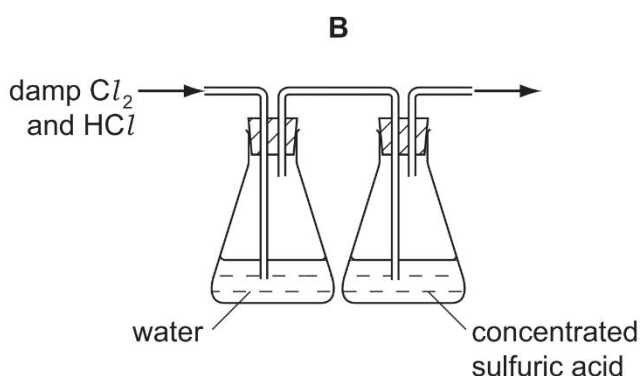
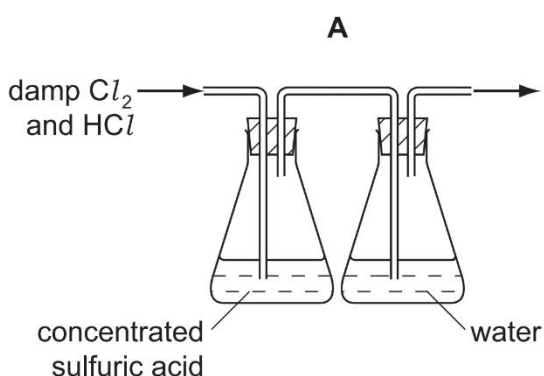
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Multiple-choice Questions on Experimental Techniques

1. Hydrogen chloride is very soluble in water, whereas chlorine is only slightly soluble in water. Both gases can be dried using concentrated sulfuric acid. Which diagram represents the correct method of obtaining pure dry chlorine from damp chlorine containing a small amount of hydrogen chloride?

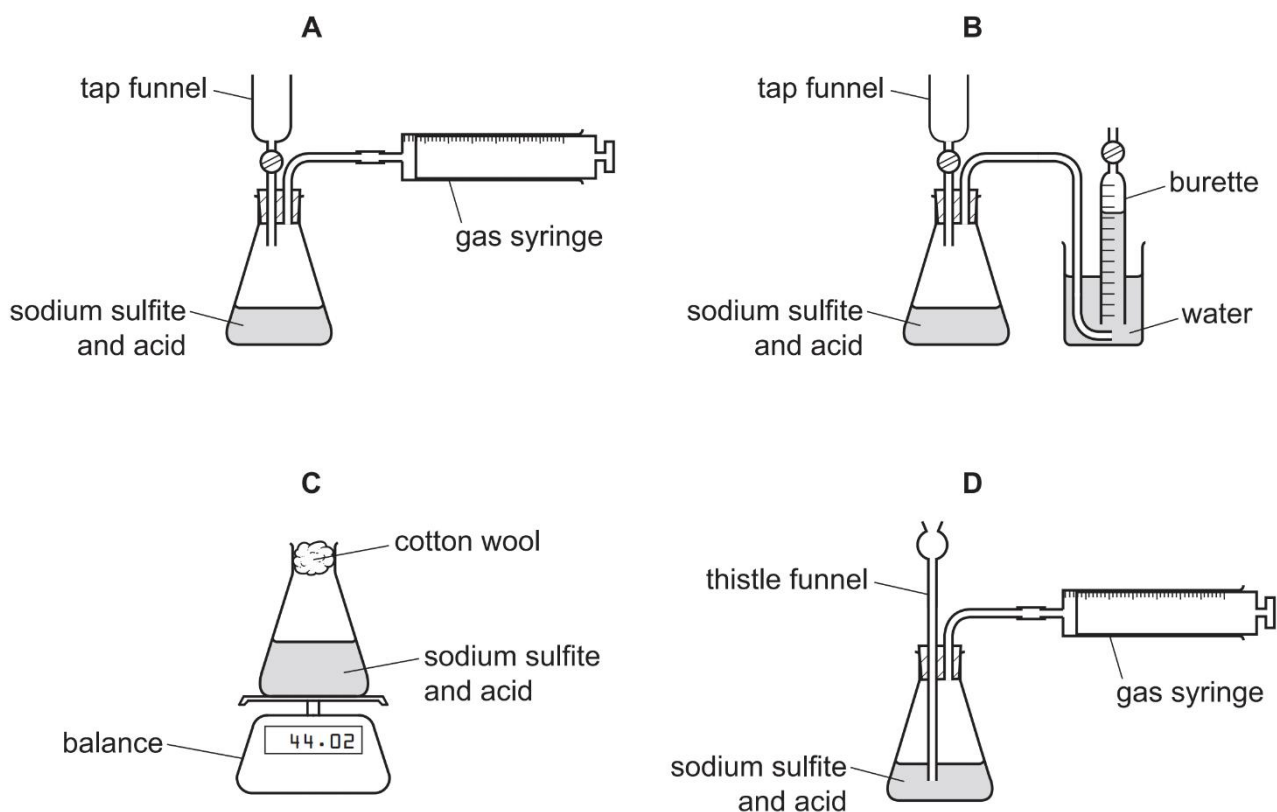


2. In a titration between an acid (in the burette) and an alkali, you may need to re-use the same titration flask.

Which is the best procedure for rinsing the flask?

- A Rinse with distilled water and then with the alkali.
- B Rinse with tap water and then with distilled water.
- C Rinse with tap water and then with the acid.
- D Rinse with the alkali.

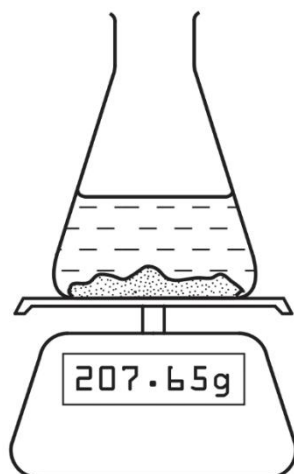
3. A student wanted to follow how the rate of the reaction of sodium sulfite with acid varies with time. The reaction produces gaseous sulfur dioxide. Which apparatus is **not** suitable?



4. Calcium carbonate reacts with hydrochloric acid, producing carbon dioxide gas.



The rate of this reaction can be measured using the apparatus shown.



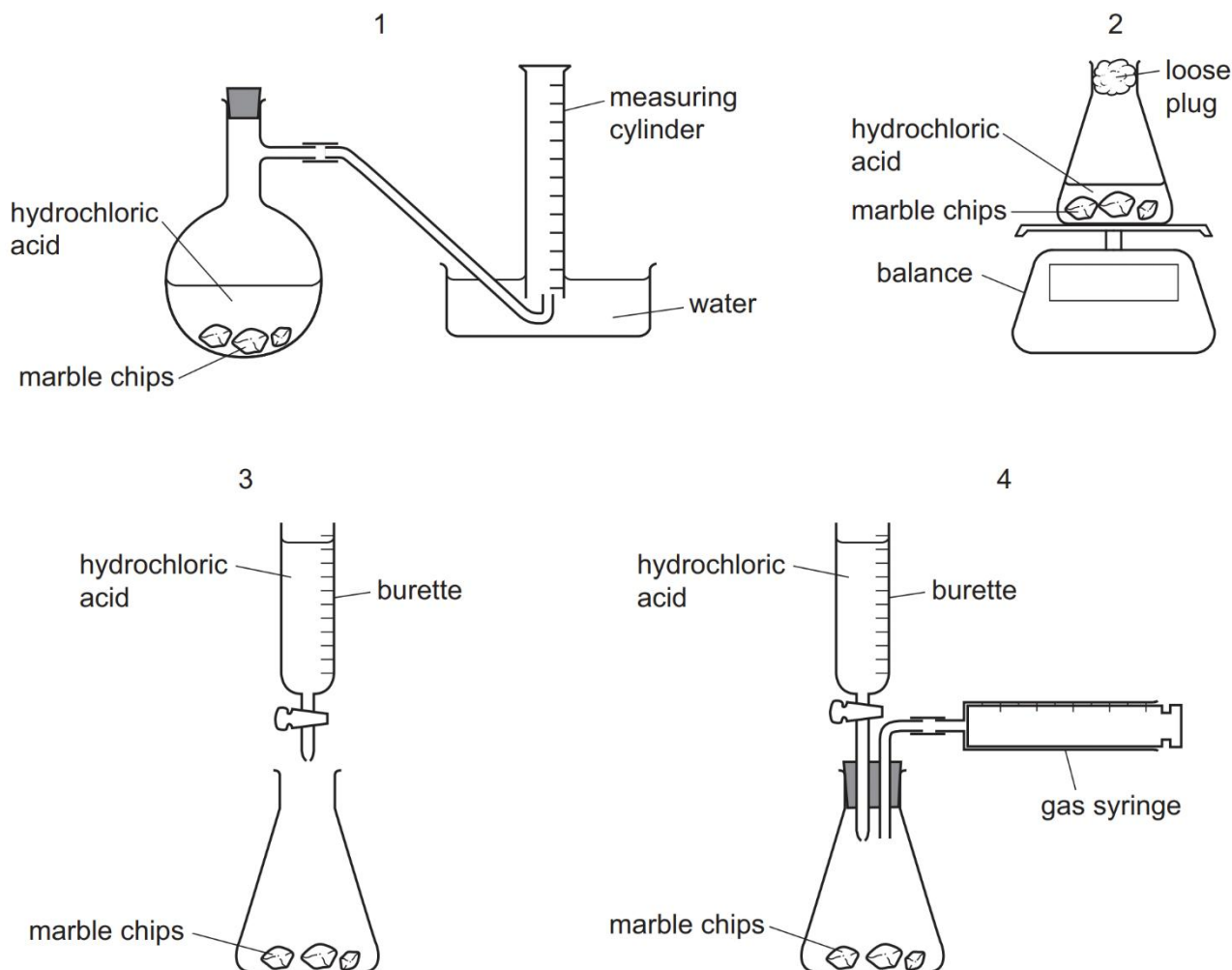
Which additional piece of apparatus is also required?

- A A burette
 B A clock
 C A gas syringe
 D A thermometer

5. A student follows the rate of the reaction between marble chips, CaCO_3 , and dilute hydrochloric acid.



Which diagrams show apparatus that is suitable for this experiment?



- A** 1 and 2 only
B 1 and 3 only
C 1 and 4 only
D 1, 2 and 4 only

6. A student titrates aqueous sodium hydroxide from a burette with dilute hydrochloric acid in a conical flask.

After the titration is complete, the conical flask is emptied.

What is the correct procedure before the next titration?

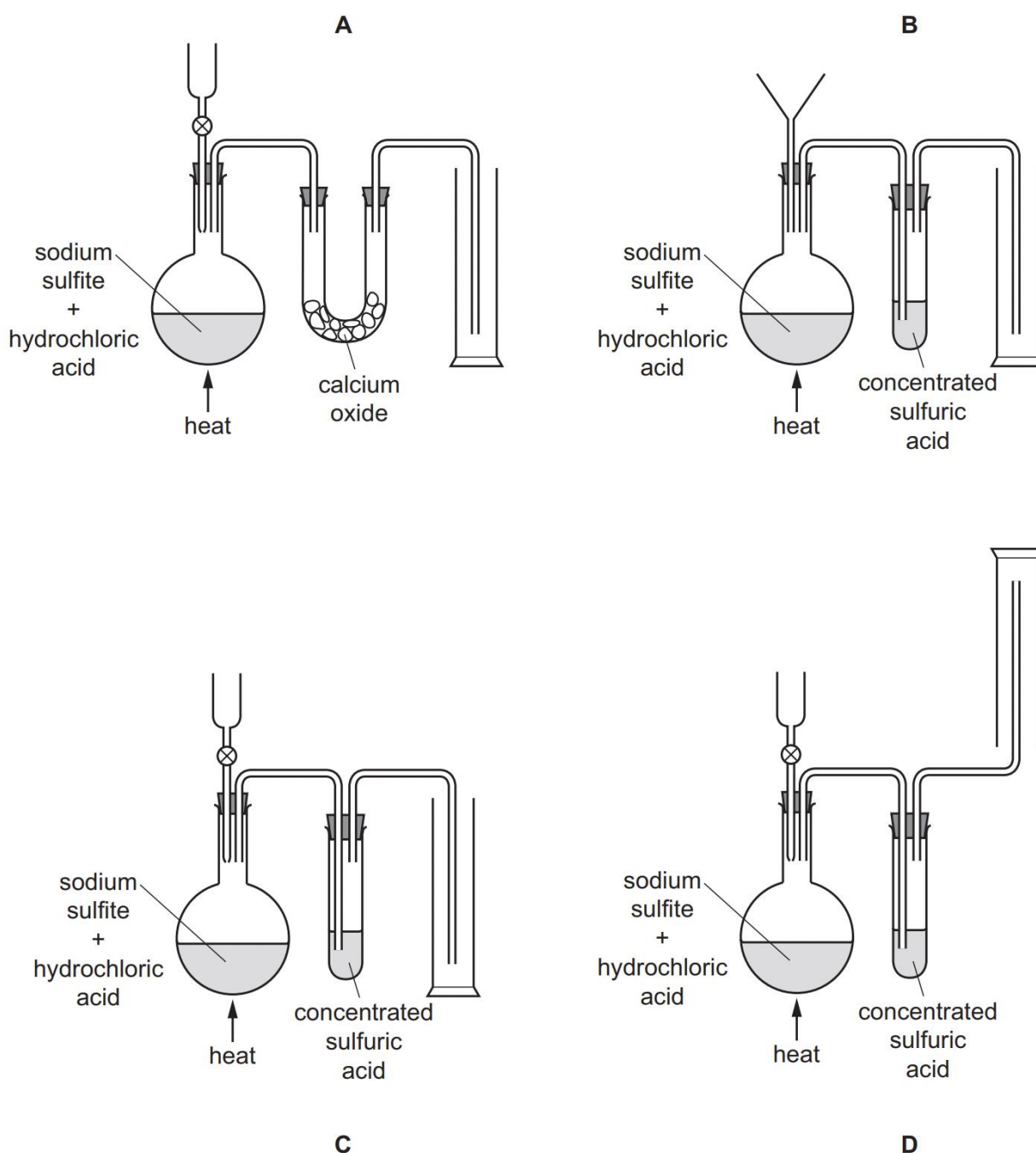
- A** Rinse out the conical flask with aqueous sodium hydroxide.
B Rinse out the conical flask with dilute hydrochloric acid.
C Rinse out the conical flask with distilled water.
D Use the conical flask again without rinsing.

7. The concentration of aqueous sodium carbonate can be found by reaction with hydrochloric acid of known concentration. The indicator methyl orange is used.

Which items of equipment are needed?

- A Burette, measuring cylinder, gas syringe
- B Burette, measuring cylinder, thermometer
- C Burette, pipette, conical flask
- D Burette, pipette, stopwatch

8. Sulfur dioxide is a gas that is prepared by heating sodium sulfite with hydrochloric acid. It is an acidic gas. Sulfur dioxide is more dense than air. Which set of apparatus is suitable for preparing and collecting a dry sample of sulfur dioxide?

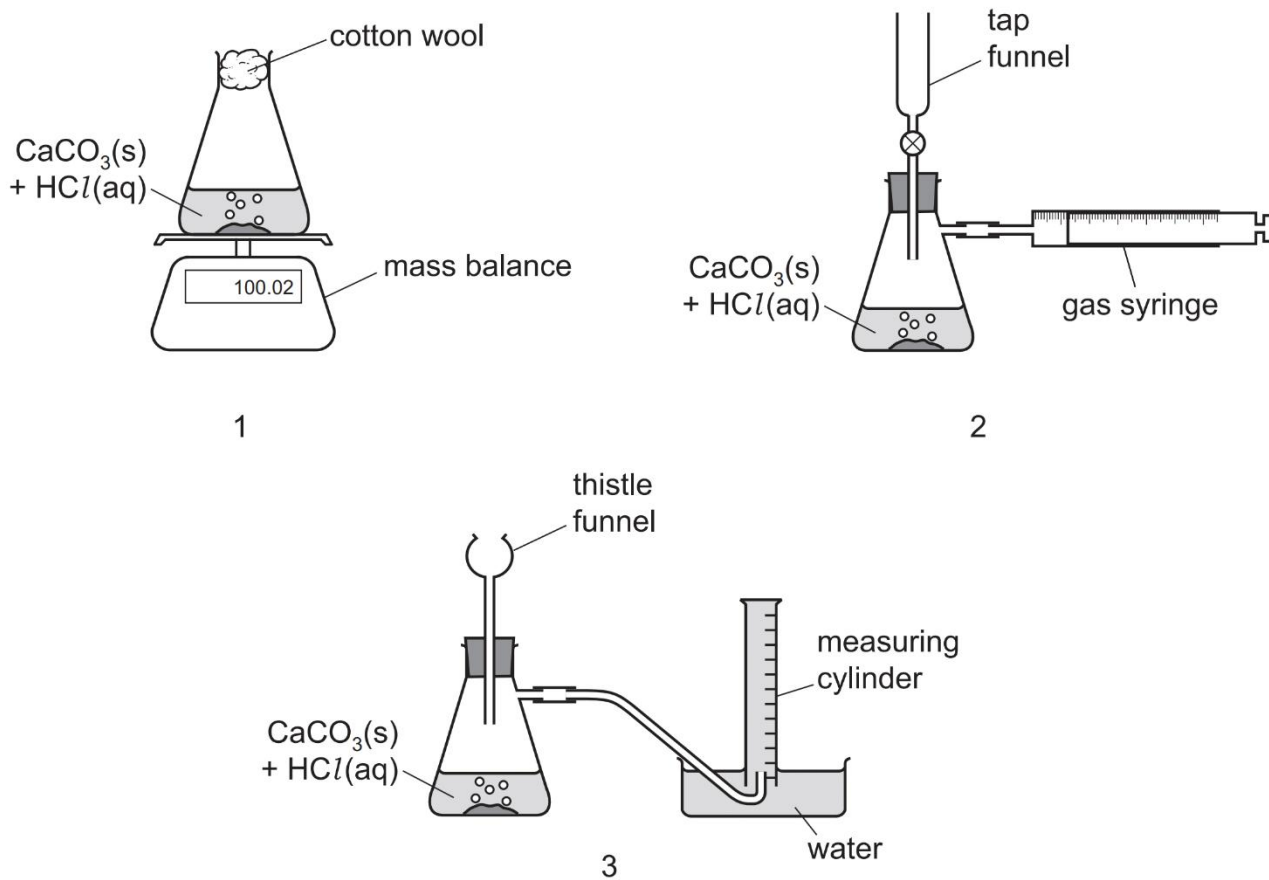


9. A student needs to measure 17.60 cm³ of hydrochloric acid. The student has access to the apparatus commonly found in a school laboratory.

Which piece of equipment should be used to measure the 17.60 cm³ of hydrochloric acid?

- A A burette
- B A gas syringe
- C A measuring cylinder
- D A pipette

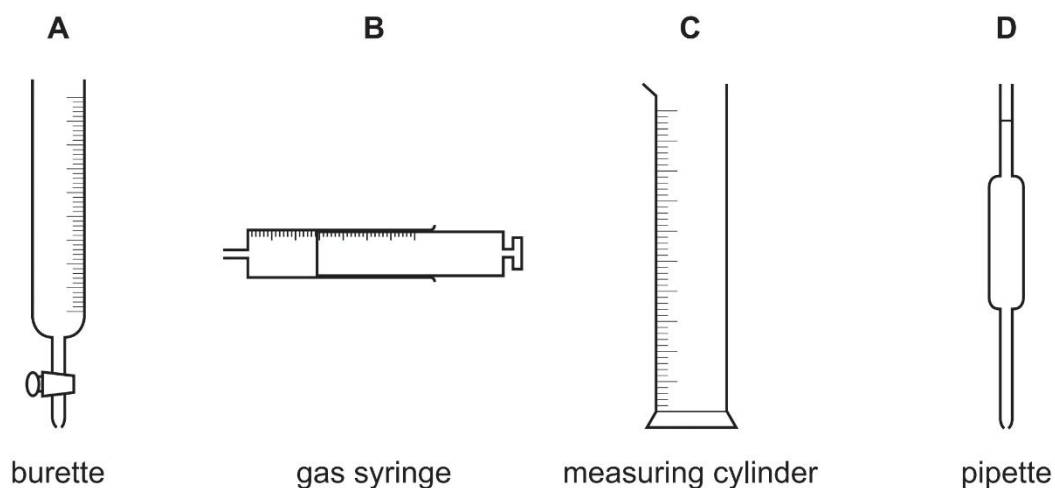
10. When calcium carbonate is added to dilute hydrochloric acid, carbon dioxide gas is released. Three sets of apparatus are shown.



Which sets of apparatus are suitable, together with a stopwatch, for following the rate of this reaction?

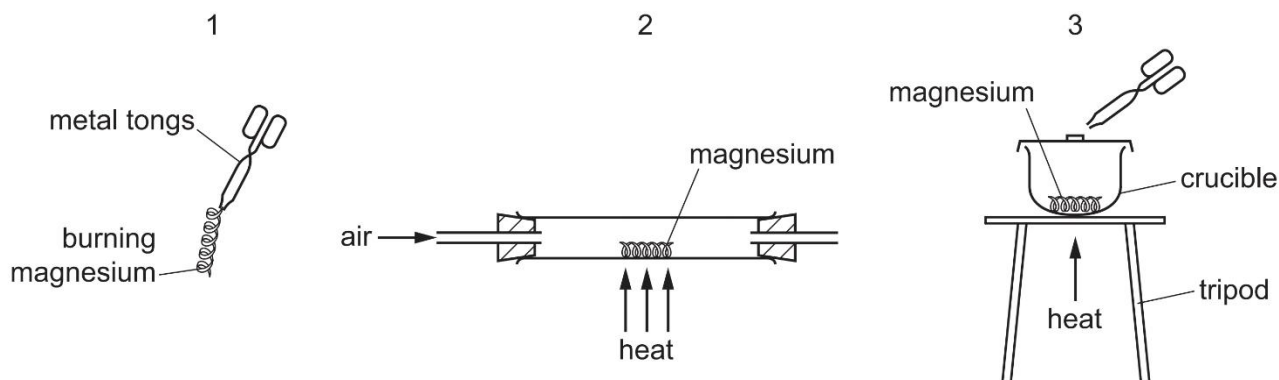
- A 1, 2 and 3
- B 1 and 2 only
- C 2 only
- D 2 and 3 only

15. The diagram shows four pieces of apparatus that are used to measure the volume of a gas or a liquid. Which piece of apparatus should always be filled to the same level?



16. When heated, magnesium reacts with oxygen in the air to form magnesium oxide, a white powder.

A student investigates the change in mass that occurs during this reaction. She is given a Balance and the three sets of apparatus shown.

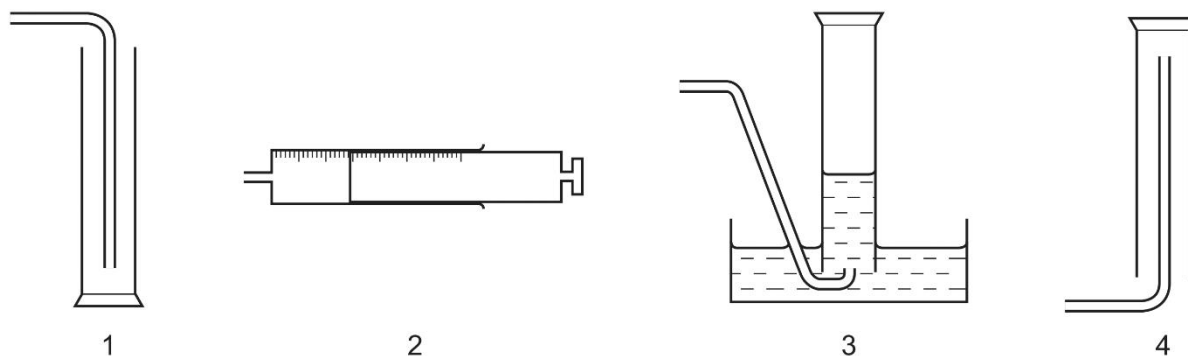


Which sets of apparatus are suitable for this investigation?

- A** 1, 2 and 3 **B** 1 and 3 only
C 2 and 3 only **D** 2 only
17. Which is the correct method for drying and collecting a sample of ammonia gas, NH_3 ?

	reagent used to dry NH_3	method used to collect NH_3
A	powdered calcium oxide	downward displacement of water
B	powdered calcium oxide	downward displacement of air
C	concentrated sulfuric acid	downward displacement of water
D	concentrated sulfuric acid	upward displacement of air

18. The diagrams show four different methods of collecting gases.



Which method is suitable for collecting a gas which has the properties described?

	method for collecting gas	properties of gas
A	1	less dense than air and soluble in water
B	2	denser than air and soluble in water
C	3	less dense than air and soluble in water
D	4	denser than air and insoluble in water

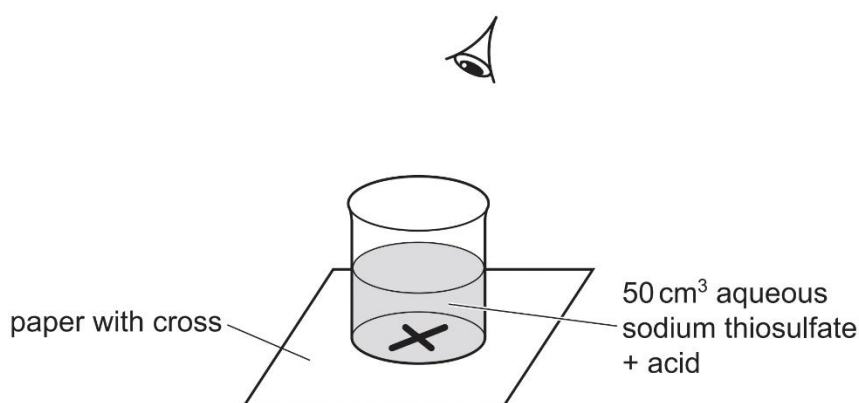
19. Aqueous sodium thiosulfate reacts with acid to make a precipitate of sulfur.



A student investigates the effect of temperature on the rate of this reaction.

The student:

- places a piece of paper with a cross on it below the reaction mixture as shown in the diagram.
- measures the time taken for the cross to no longer be seen.
- repeats the reaction at different temperatures.

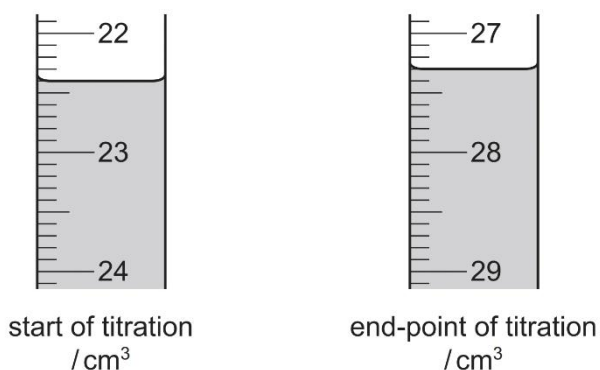


Which apparatus is needed for this investigation?

- A** Balance, pipette, stop-clock
- B** Balance, stop-clock, thermometer
- C** Burette, gas syringe, thermometer
- D** Measuring cylinder, stop-clock, thermometer

20. During a titration experiment, an acid is transferred into a burette.

The diagrams show part of the burette at the start of the titration and at the end-point.

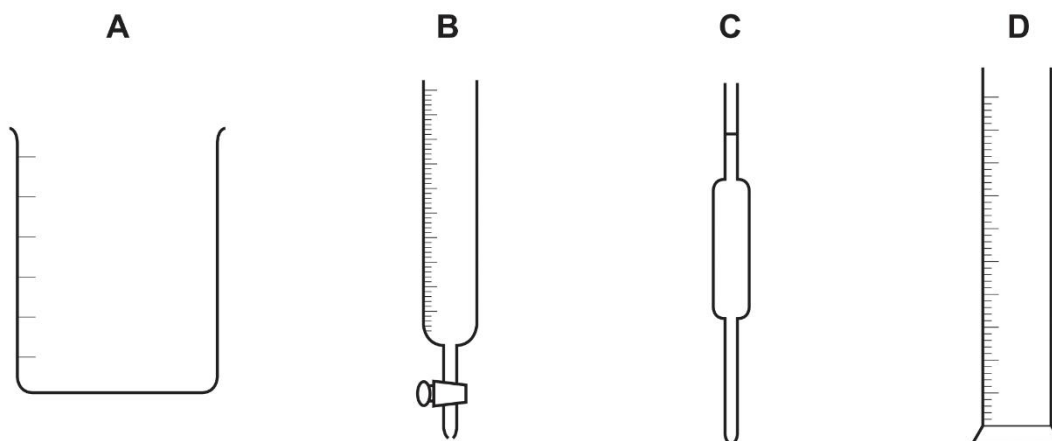


What is the volume of acid used during the titration?

- A** 3.70 cm³ **B** 4.90 cm³ **C** 5.10 cm³ **D** 6.30 cm³

21. A student has to measure 28.2 cm³ of aqueous sodium bromide.

Which piece of apparatus should the student select?



22. A scientist needs to add approximately 100 cm³ of water to each of 50 large beakers. The scientist needs to fill the beakers as quickly as possible.

Which method should be used?

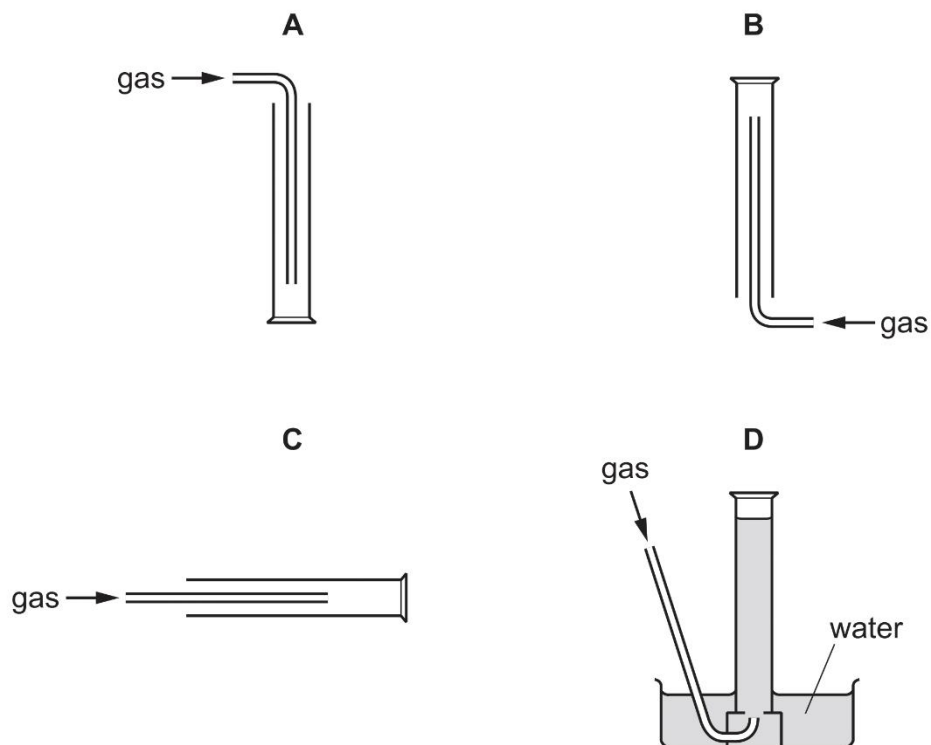
- A** A 50 cm³ burette should be used twice for each beaker.
B A 100 cm³ gas syringe should be used once for each beaker.
C A 25 cm³ graduated pipette should be used four times for each beaker.
D A 100 cm³ measuring cylinder should be used once for each beaker.

23. Which is the correct method for drying and collecting a sample of ammonia gas, SO_2 ?

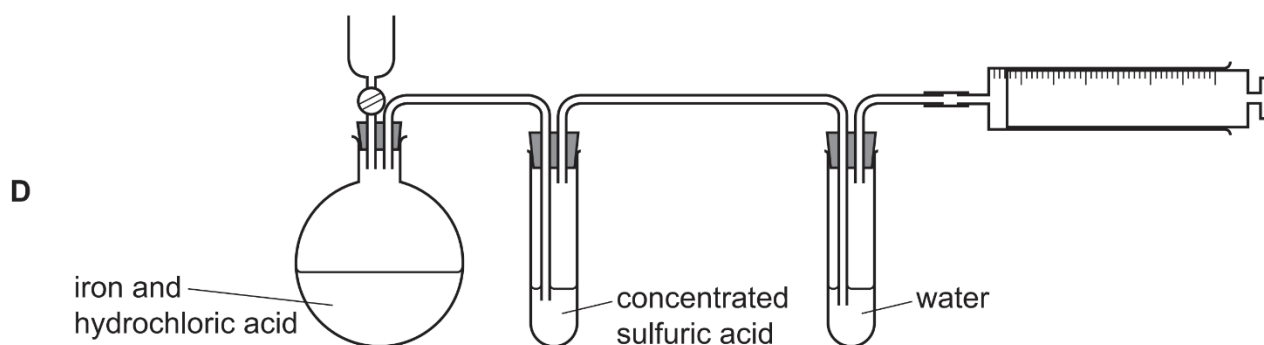
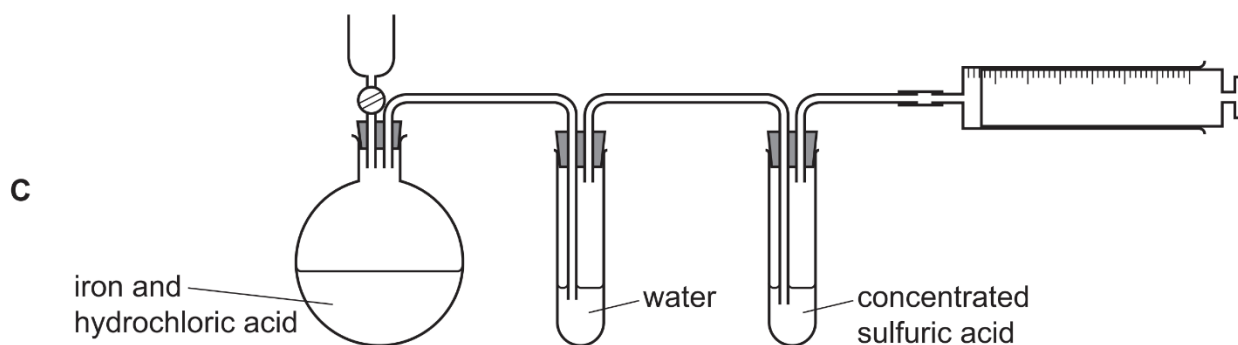
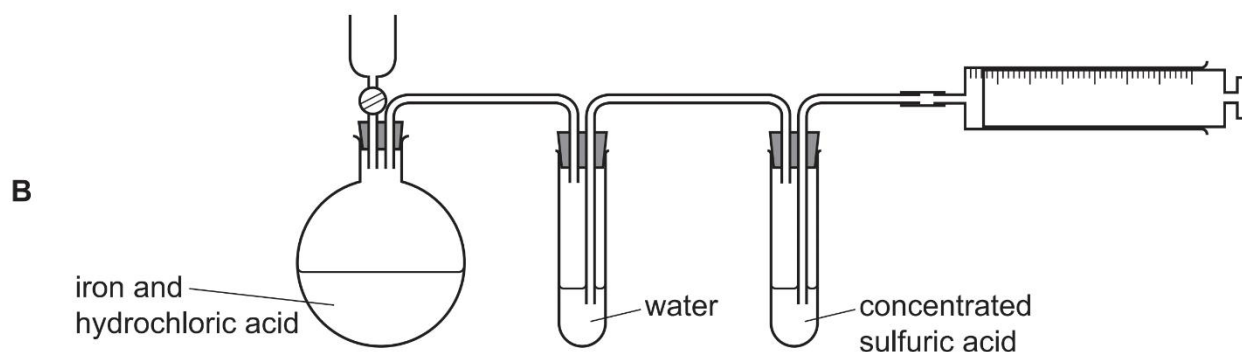
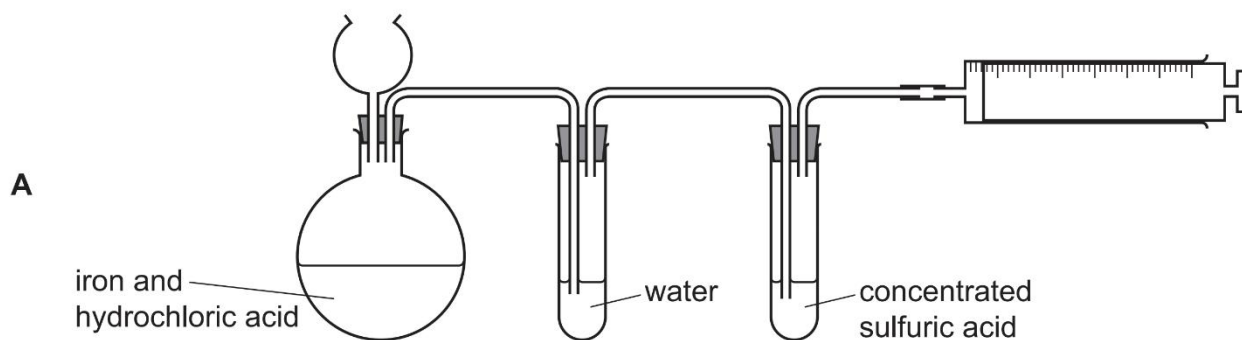
	reagent used to dry SO_2	method used to collect SO_2
A	powdered calcium oxide	downward displacement of water
B	powdered calcium oxide	downward displacement of air
C	concentrated sulfuric acid	downward displacement of water
D	concentrated sulfuric acid	upward displacement of air

24. A gas is less dense than air and dissolves in water.

Which diagram shows the correct method of collecting this gas?



25. When iron reacts with dilute hydrochloric acid, hydrogen gas is formed. Impurities in the iron mean that some hydrogen sulfide gas is also formed. Hydrogen sulfide gas is soluble in water. Water vapour can be removed from a mixture of gases using concentrated sulfuric acid. Which diagram shows apparatus suitable to prepare a pure, dry sample of hydrogen?



- Scan the QR Code below to view the answers to this assignment.



http://www.chemist.sg/purification/purification_mcq/experimental_mcq_ans.pdf