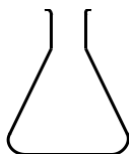


(ii) What is the name of this piece of equipment?



Tick (✓) **one** box.

Beaker

☐

Conical flask

☐

Delivery tube

☐

Measuring cylinder

☐

[1]

(b) Suggest **one** safety precaution the student should take when working with acid.

.....

..... [1]

(c) A gas forms when hydrochloric acid and calcium carbonate powder react.

Draw **one** line from the **gas collected** to the **chemical test** that can identify the gas.

Gas collected

Chemical test

Carbon dioxide

Burns with a squeaky pop.

Hydrogen

Turns universal indicator blue

Oxygen

Turns lime water cloudy when it is bubbled through.

[2]

- (d) The student repeats the experiment with different **concentrations** of hydrochloric acid.
- (i) Explain why the rate of reaction increases when the concentration of the hydrochloric acid increases.

Use ideas about collisions in your answer.

.....

.....

.....

..... [2]

- (ii) The student wants to ensure that the data they collect is valid.

State **two** variables that the student needs to control in this experiment.

1

2

[2]

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Page 5 of 51

- 8 Doctors select radioactive isotopes for imaging scans and for treatments very carefully.

The table shows the radiation emitted and half-lives of 6 radioactive samples.

Sample	Radiation Emitted	Half-life
A	Alpha	10 days
B	Alpha	1600 years
C	Beta	8.0 days
D	Beta	2.7 days
E	Gamma	5.3 years
F	Gamma	8 days

- (a) Which sample is suitable to be used as a radioactive tracer for an imaging scan?

Explain your answer.

Use data from the table.

Sample

Explanation

.....

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 Page 21 of 51

[3]

- (b) Samples A and B emit alpha radiation.

Suggest **two** precautions that should be taken by hospital staff when handling samples A and B.

1

2

[2]

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Page 31 of 51

5. Work crossed out:
- where a candidate crosses out an answer and provides an alternative response, the crossed out response is not marked and gains no marks
 - if a candidate crosses out an answer to a whole question and makes no second attempt, and if the inclusion of the answer does not cause a rubric infringement, the assessor should attempt to mark the crossed out answer and award marks appropriately.
6. Always check the pages (and additional copies if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.
7. There is an NR (No Response) option. Award NR (No Response)
- if there is nothing written at all in the answer space
 - OR if there is a comment which does not in any way relate to the question (e.g. 'can't do', 'don't know')
 - OR if there is a mark (e.g. a dash, a question mark) which isn't an attempt at the question.
- Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).
8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
- If you have any questions or comments for your Team Leader, use the phone, the RM Assessor messaging system, or email.
9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
()	Words which are not essential to gain credit
—	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

Question			Answer	Marks	AO element	Guidance
8	(a)		D or F ✓ If D is selected Has the shortest half life (of the beta emitters) ✓ Can be detected outside the body ✓ If F is selected Any two from: Has the shortest half life (of the gamma emitters) ✓ Least ionising / most penetrating ✓ Can be detected outside the body ✓	3	3.2a	If C is selected maximum 1 mark for the correct explanation: can be detected outside the body If E is selected maximum 2 marks for the correct explanations: can be detected outside the body and least ionising / most penetrating ALLOW leaves the body
	(b)		Any two from: Wear device that tells you when you've been exposed too long ✓ Store it in (lead-lined) box / container ✓ Wear protective clothing / wear gloves ✓ Do not touch it (if solid) / use tongs ✓ Wash hands after use ✓ Do not point sources directly at people ✓ Reduce time handling ✓	2	3.3a	IGNORE leaving the room as this question asks about 'handling' the source IGNORE 'reduce the amount exposed to' unqualified IGNORE goggles

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Page 51 of 51