

M1.(a) time from when the heating is started until

1

the limewater turns cloudy / milky

1

(b) (i) the temperature was not high enough

*accept the copper carbonate had not started to decompose / react
accept it takes time to heat up the copper carbonate*

1

the bubbles of gas were air

accept no carbon dioxide produced

1

(ii) the copper carbonate was decomposing / reacting

*accept the temperature was high enough to cause decomposition
/ a reaction*

1

so carbon dioxide was produced

allow correct word / symbol equation

1

(iii) copper oxide was produced

allow correct word / symbol equation

1

because the copper carbonate had completely decomposed / reacted

ignore all of the carbon dioxide had been given off

1

[8]

M2. (a) (i) carbon dioxide / CO₂ 1

carbonate / CO₃²⁻
answers must be in the order shown
marks are independent 1

(ii) ammonia / NH₃ 1

litmus
answers must be in the order shown
marks are independent 1

(b) (i) solution is blue
accept blue precipitate only if sodium hydroxide added
allow blue liquid
allow copper sulfate / copper ions are blue 1

(ii) barium chloride / BaCl₂
allow barium nitrate / barium ions / Ba²⁺ 1

white
answers must be in the order shown
marks are independent 1

[7]

M3. (a) limewater / calcium hydroxide 1

(limewater) goes milky / cloudy

do not allow this mark if lime water added to solution or powder

or

gives white precipitate / solid

1

(b) eg flame colour of (Na) and flame colour of (K) interfere / mask / mix with each other

accept difficult to determine the colour

or

hard to distinguish

accept some indication that two distinct colours are not seen

1

(c) (i) barium chloride (solution) / BaCl_2

ignore mention of acidification but

do not allow sulfuric acid.

wrong reagent = no mark

1

white precipitate / white solid

allow white barium sulfate

or

barium sulfate precipitate

1

(ii) white precipitate / white solid

ignore goes milky

do not accept any mention of precipitate dissolving

1

[6]

- M4.** (a) hydrogen
accept H_2
*do **not** accept H* 1
- (b) litmus paper / Universal Indicator paper / pH paper
allow any suitable named indicator 1
- bleached / turns white **or** loses its colour
*do **not** accept bleached cloth / leaves etc.*
allow second mark unless incorrect indicator given
allow starch iodide paper (1)
goes black / blue black (1)
allow potassium iodide solution (1) goes brown / orange / black precipitate (1) 1
- (c) because they have a negative charge **or** opposite charges attract
accept (because) it is Cl^-
*accept chlorine, Cl **or** chlorine ions has a negative charge*
*do **not** accept Cl^- on its own*
*do **not** accept Cl_2 o.e. has negative charge* 1
- (d) kill bacteria / germs, etc. **or** sterilise / disinfect
accept destroys bacteria etc.
ignore clean / purify water (owtte)
*do **not** accept just gets rid of bacteria* 1
- (e) hydroxide (ion)
accept OH^- 1

[6]

- M5.** (a) (i) H_2O_2 reactant correct
ignore any state symbols 1
- $\text{H}_2\text{O} + \text{O}_2$ products correct 1
- $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$ balanced
accept correct multiple 1
- (ii) glowing splint 1
- relights
accept 'bursts into flame'
*do **not** accept a lighted splint burns brighter **or** faster* 1
- (b) unchanged
*accept **not** used up **or** left (behind)* 1
- (c) (i) gas syringe **or** measuring cylinder **either** with scale drawn **or** labelled 1
- the apparatus as drawn would work 1
- (ii) correct plotting of points
***one** mark to be deducted for each error* 2
- best fit graph line drawn (single line drawn) 1
- (iii) concentration of hydrogen peroxide decreases
accept less particles of hydrogen peroxide to collide

do not accept hydrogen peroxide gets used up

1

rate of reaction decreases

accept reaction gets slower

1

(iv) any two from:

- temperature
- pressure
- division of catalyst **or** manganese oxide
do not accept any other factors

2

[15]

##

- (a) oxygen/O₂
for 1 mark 1
- (b) water/H₂O
for 1 mark 1
- (c) carbon dioxide/CO₂
(if symbols are used they must be correct)
for 1 mark 1
- (d) gives out
for 1 mark 1
- heat or energy (2 independent marks)
for 1 mark 1

[5]