Pearson Edexcel

Additional Assessment Materials Summer 2021

Pearson Edexcel GCSE in Chemistry (1CH0) Foundation

Resource Set Topic E: Acids, bases and salts – including preparation of salts

Questions

(Public release version)

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Additional Assessment Materials, Summer 2021

General guidance to Additional Assessment Materials for use in 2021

Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an **optional** part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

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(b) Acids are used to make salts.

Give the name of the acid used to make chlorides.

(1)

hydrochloric acid

(c) Salts of metals can be prepared by reacting the metal with an acid to produce the salt and hydrogen.

(i) Describe the test to show that the gas is hydrogen.

(2)

Lighted splint goes off with a pop sound in the presence of hydrogen.

8e

(e) Excess solid nickel carbonate is added to dilute sulfuric acid in a beaker.

nickel carbonate + sulfuric acid → nickel sulfate + carbon dioxide + water

Nickel sulfate is formed in solution.

Describe how a sample of pure, dry nickel sulfate crystals can be obtained from the mixture of nickel sulfate solution and excess solid nickel carbonate in the beaker.

(3)

Filter the mixture using a filter funnel and filter paper. Heat the remaining filtrate using a bunsen burner until the crystallisation point is reached. Wash the crystals will distilled water and dry with filter paper.

4ci-ii

(c) When burnt completely in air, butene forms carbon dioxide and water.

(i) Balance the equation for this reaction by putting numbers in the spaces provided.

(2)

$C_4H_8 + 6O_2 \rightarrow$ 4 CO_2 + 4 H_2O

(ii) Describe the test to show that a gas is carbon dioxide.

(2)

Bubble the gas through limewater. If CO_2 is present, limewater turns cloudy.

1 (a) When solid sodium chloride is mixed with water, sodium chloride solution forms.

What name is given to the process of mixing a solid with water to form a solution?

(1)

- ☐ **A** crystallising
- ☐ **B** diluting
- ☒ **C** dissolving
- ☐ **D** melting

(b) Sodium reacts with hydrochloric acid to form sodium chloride and hydrogen.

(i) Write the word equation for this reaction.

(2)

sodium + hydrochloric acid → sodium chloride + hydrogen

(ii) The hazard symbol shown in Figure 1 is used on containers of sodium.

Figure 1

What is the meaning of this hazard symbol?

(1)

- ☒ **A** corrosive
- ☒ **B** flammable ✓
- ☒ **C** oxidising
- ☒ **D** toxic

(c) The pH of a sodium chloride solution was measured.

(i) State what could be used to measure the pH of a solution.

(1)

universal indicator

(ii) Sodium chloride solution is neutral.

Give the pH of this solution.

(1)

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(b) Aluminium oxide reacts with hydrochloric acid to form a salt and water.

(i) State the name of the salt formed.

(1)

aluminium chloride

(ii) In this reaction aluminium oxide is a base.

State the type of reaction that takes place when an acid reacts with a base.

(1)

neutralisation

9 The word equation for the reaction between copper carbonate and dilute sulfuric acid is

$$\text{copper carbonate} + \text{sulfuric acid} \rightarrow \text{copper sulfate} + \text{carbon dioxide} + \text{water}$$

(a) (i) Complete the balanced equation for this reaction.

(2)

$$CuCO_3 + H_2SO_4 \rightarrow CuSO_4 + CO_2 + H_2O$$

(iii) What is the chemical test to show that a gas is carbon dioxide?

(1)

☒ **A** bubble the gas through limewater, limewater turns cloudy

☐ **B** put damp blue litmus paper in the gas, litmus paper turns red

☐ **C** put a lighted splint into the gas, splint is extinguished

☐ **D** measure the pH of the gas, pH = 4

(b) Figure 12 shows a conical flask containing dilute sulfuric acid.
Copper carbonate is added to the acid in the flask.
The copper carbonate is added one spatula measure at a time until the reaction has finished.

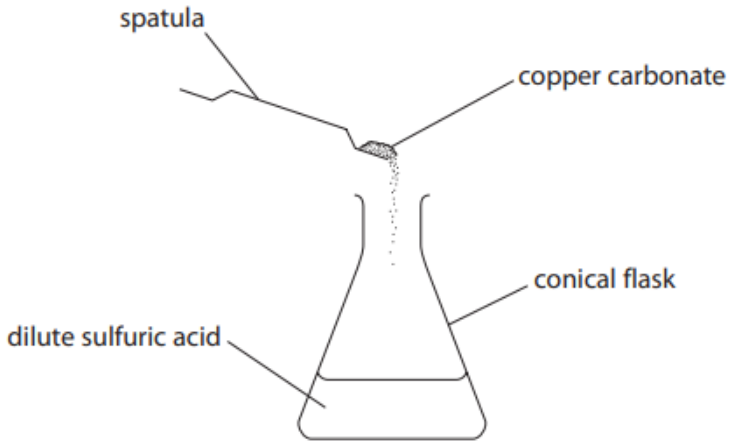

Figure 12

(i) State **two** observations that would show the reaction has finished.

(2)

1 copper carbonate stops dissolving

2 no effervescence observed

*(ii) Describe how you would obtain a solution of copper sulfate from the mixture and how you would obtain pure, dry copper sulfate crystals from this solution.

Your description should include the apparatus you would use.

You may wish to use diagrams in your answer.

(6)

Filter the mixture to remove excess copper carbonate. Heat the remaining filtrate using bunsen burner, until the crystallisation point is reached. Remove the crystals and rinse them with distilled water and dry them with filter paper.

TOTAL FOR PAPER IS 29 MARKS