Pearson Edexcel

Additional Assessment Materials Summer 2021

Pearson Edexcel GCSE in Chemistry (1CH0) Higher

Resource Set Topic A: Atomic Structure and the Periodic table

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- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.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.

2 In Figure 1, the letters **A**, **E**, **G**, **J**, **X** and **Z** show the positions of six elements in the periodic table.

These letters are not the symbols of the atoms of these elements.

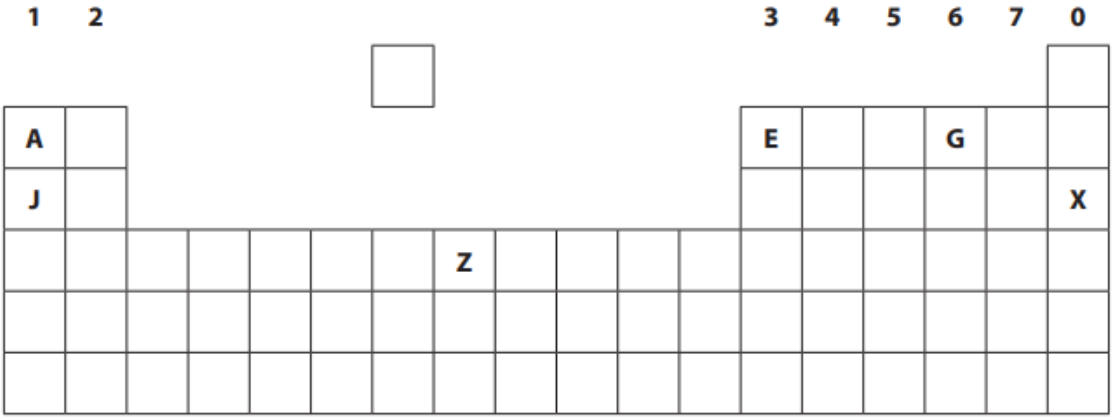

Figure 1

(a) Using the letters **A**, **E**, **G**, **J**, **X** and **Z**

(i) give the letters of the **two** elements that are non-metals

(1)

G & X

(ii) give the letters of **two** elements in period 2

(1)

A & E

(b) Element **E** has an atomic number of 5.
In a sample of **E** there are two isotopes. One isotope has a mass number of 10 and the other isotope has a mass number of 11.

(i) Explain, in terms of subatomic particles, what is meant by the term **isotopes**.

(2)

Isotopes are the same element which contain the same number protons and electrons, but different numbers of neutrons.

(ii) All atoms of element **E** in this sample contain

(1)

☒ **A** 5 protons

☒ **B** 5 neutrons

☒ **C** 6 protons

☒ **D** 6 neutrons

(c) Element **X** has an atomic number of 18.

State the electronic configuration of an atom of element **X**.

(1)

2.8.8

6 Titanium and iron are examples of transition metals.

(a) Figure 6 shows the percentage abundance of each isotope in a sample of titanium.

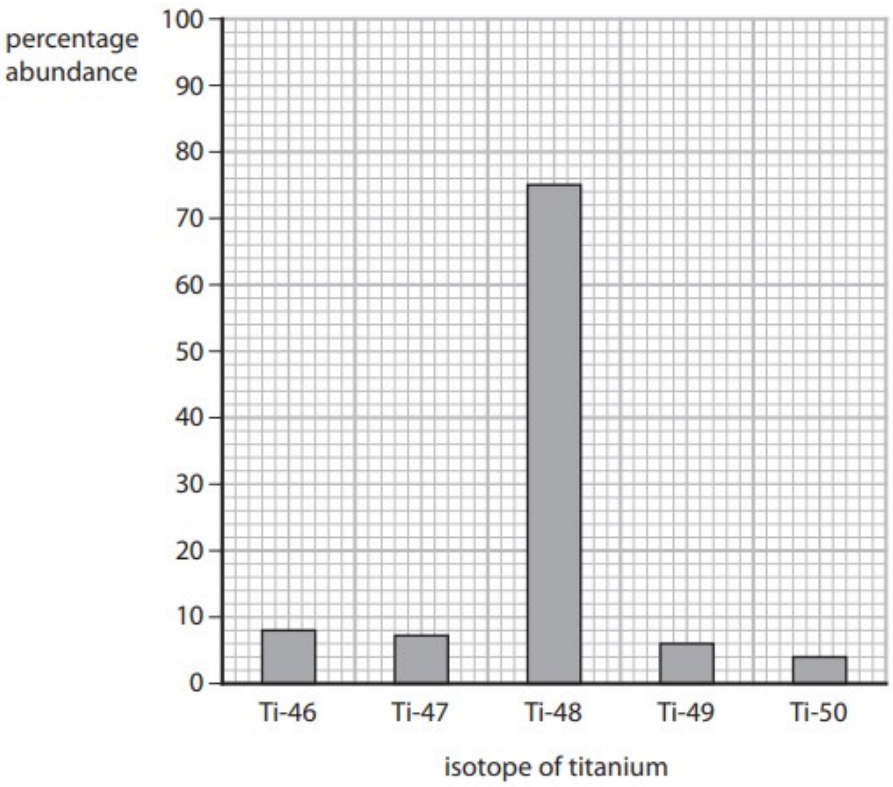

Figure 6

Calculate the relative atomic mass of titanium in this sample.

(3)

$$\frac{46(8) + 47(7) + 48(75) + 49(6) + 50(4)}{100} = 47.91$$

relative atomic mass = 47.91

8 (a) Calcium has an atomic number of 20.
A calcium atom has a mass number of 40.

(i) Which row of the table shows the number of protons and number of neutrons in this atom of calcium?

(1)

		number of protons	number of neutrons
☒	**A**	20	20
☐	**B**	40	20
☐	**C**	20	60
☐	**D**	60	20

(ii) Figure 8 shows the arrangement of electrons in an atom of calcium.

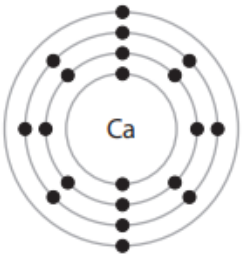

Figure 8

Explain, using the information in Figure 8, in which period of the periodic table calcium can be found.

(2)

In a calcium atom, there are 4 shells which are occupied by electrons, so calcium can be found in period 4.

2 (a) A chlorine atom contains 17 electrons, 18 neutrons and 17 protons.

(i) State the mass number of this chlorine atom.

(1)

35

(ii) Give the electronic configuration of this chlorine atom.

(1)

2.8.7

6 Some of the elements in the periodic table are metals.

(a) The electronic configuration of a metal is 2.8.3

Which row shows the group and period of the periodic table where this metal is found?

(1)

	group	period
☐ **A**	2	3
☐ **B**	2	8
☐ **C**	3	2
☒ **D**	3	3

(c) Lithium has two naturally occurring isotopes, lithium-6 and lithium-7.

A sample of lithium contains
7.59% of lithium-6
92.41% of lithium-7.

Calculate the relative atomic mass of lithium in this sample.

Give your answer to two decimal places.
You must show your working.

(4)

$\frac{7.59(6) + 92.41(7)}{100} = 6.9241$

$\simeq 6.92$

relative atomic mass of lithium = 6.92

2

(b) Potassium and caesium are in the same group of the periodic table.

Explain, in terms of electrons, why potassium and caesium are in the same group.

(2)

Both potassium and caesium atoms have 1 electron in their outermost shell, therefore they are both found in Group 1.

TOTAL FOR PAPER IS 21 MARKS