Pearson Edexcel

Additional Assessment Materials Summer 2021

Pearson Edexcel GCSE in Chemistry (1CH0) Foundation

Resource Set Topic A: Atomic Structure and the Periodic table

Questions

(Public release version)

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

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- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.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

3 (a) Atoms contain electrons, neutrons and protons.

(i) Draw one line to link each particle to its correct relative charge.

(2)

particle	relative charge
electron	+1
neutron	0
proton	–1

(ii) Which of the following is the relative mass of a proton?

(1)

☒ **A** 0

☒ **B** $\frac{1}{1837}$

☒ **C** 1

☒ **D** –1

(b) Argon is in group 0 of the periodic table.

Identify, using the periodic table on the back cover of this paper, which of these elements is in the same period as argon.

(1)

☒ **A** bromine

☒ **B** iron

☒ **C** magnesium

☒ **D** xenon

(c) Figure 4 shows the atomic number and mass number of two isotopes of argon.

isotope	atomic number	mass number
argon-38	18	38
argon-40	18	40

Figure 4

Describe the structure of an atom of argon-38 and of an atom of argon-40.

(3)

8 In Figure 8, 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.

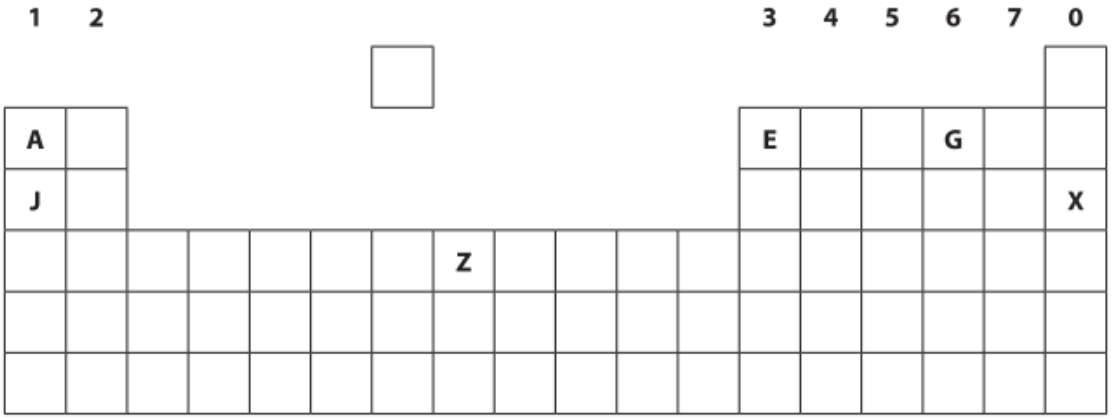

Figure 8

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

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

(1)

.....

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

(1)

.....

(ii) Figure 13 shows the percentage of each base in human DNA.

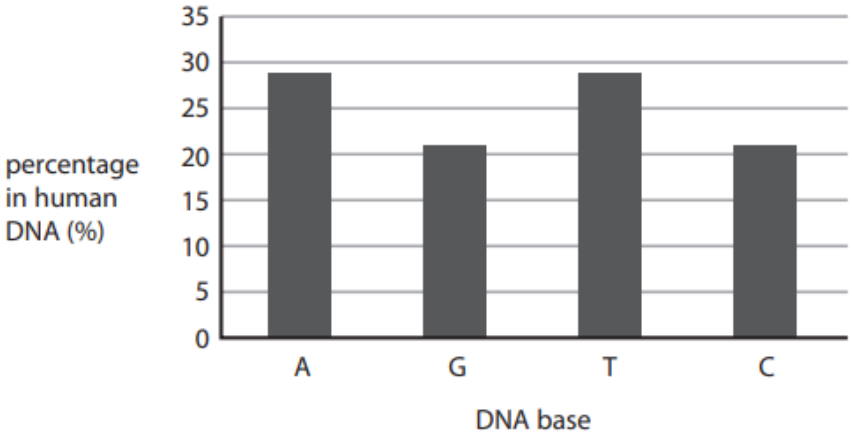

Figure 13

Describe how this data provides evidence for base pairing in DNA.

(2)

(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)

(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 Chlorine has an atomic number of 17.

(a) Figure 3 shows the arrangement of electrons in an atom of chlorine.

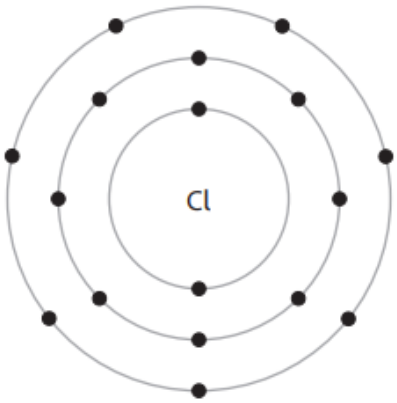

Figure 3

(i) What is the electronic configuration of this atom?

(1)

☒ **A** 10.7

☒ **B** 17

☒ **C** 2.8.7

☒ **D** 7.8.2

(ii) Explain, using Figure 3, why chlorine belongs to group 7 of the periodic table.

(2)

(b) The nucleus of an atom is made up of protons and neutrons.
Atoms of chlorine contain 17 protons.

Figure 4 shows some information about a proton, a neutron and an electron.

	relative mass	relative charge
proton	1	+1
neutron	1	0
electron	very small	−1

Figure 4

(i) Explain, using the information in Figure 3 and Figure 4, why atoms of chlorine have no overall charge.

(2)

.....

.....

.....

.....

(ii) Atoms of chlorine-37 have a mass number of 37.

Calculate the number of neutrons in atoms of chlorine-37.

(1)

.....

number of neutrons = ...

(iii) There are two isotopes of chlorine, chlorine-35 and chlorine-37.

Explain the meaning of the term **isotopes**.

(2)

.....

.....

.....

.....

(Total for Question 2 = 8 marks)

4 (a) In the 19th century, Mendeleev arranged the elements known at the time to form his periodic table.
Mendeleev's periodic table is different from the modern periodic table.

State **one** difference between Mendeleev's periodic table and the modern periodic table.

(1)

.....

.....

(c) Gallium, Ga, is in the same group of the modern periodic table as aluminium.

The formula of aluminium oxide is Al_2O_3.

(i) Predict the formula of gallium oxide.

(1)

.....

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

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

(1)

.....

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

(1)

.....

1.

(c) An atom of an element has an atomic number and a mass number.

Draw one straight line from each of these to the numbers of subatomic particles it shows to be present in an atom.

(2)

	number of subatomic particles in an atom
	number of protons
atomic number	number of neutrons
	total number of protons and electrons
mass number	total number of protons and neutrons
	total number of protons, neutrons and electrons

8.

(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)

.....

.....

.....

.....

TOTAL FOR PAPER IS 29 MARKS