Pearson Edexcel

Additional Assessment Materials Summer 2021

Pearson Edexcel GCSE in Chemistry (1CH0) Foundation

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- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.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

8b

(b) Describe what you would **see** if damp, blue litmus paper is placed into chlorine gas.

(2)

damp blue litmus paper turns red then white

8d

(d) When the gas hydrogen chloride, HCl, is dissolved in water, a solution forms. Blue litmus paper dipped in this solution turns red.

State why the litmus paper turns red.

(1)

hydrochloric acid is formed when HCl gas dissolves in water

8ei_ii

(e) (i) Figure 13 lists the halogens in the order in which they appear in group 7 of the periodic table.

The melting points of four of the halogens are given.

halogen	melting point in °C
fluorine	–220
chlorine	–101
bromine	–7
iodine	
astatine	302

Figure 13

Estimate the melting point of iodine.

(1)

150 °C

(ii) Bromine reacts with heated iron.

Give the name of one halogen that would react with iron more vigorously than bromine.

(1)

chlorine

9b, ci-ii

9 Lithium, sodium and potassium are reactive metals in group 1 of the periodic table.

(b) Sodium reacts with water to form sodium hydroxide in solution and hydrogen.

Complete the balancing of the equation for this reaction and add the state symbols for each substance.

(3)

2 Na(s) + 2H_2O(l) → 2 NaOH(aq) + H_2(g)

(c) In an experiment equal-sized pieces of lithium, sodium and potassium are added to separate samples of water.

(i) A flame is produced only with potassium because potassium

(1)

☒ **A** is the softest metal

☒ **B** has the lowest melting point

☑ **C** is the most reactive

☒ **D** is the only flammable metal

*(ii) A teacher demonstrated this experiment.

The results are shown in Figure 14.

	lithium	sodium	potassium
position of metal in water	floats	floats	floats
movement of metal	slow	fast	very fast
effervescence / bubbling	slow	fast	very fast

Figure 14

Describe, in detail, how the teacher would demonstrate this experiment safely, showing how the results give the order of reactivity of the metals.

(6)

The teacher would need to wear goggles and gloves during the demonstration. Only a small amount of metal should be used.

Once the metal has been put into water, the teacher should move away and observe at a distance.

Potassium reacts the most vigorously so it is the most reactive. Lithium reacts the slowest and the least vigorous so it is least reactive.

2 (a) Complete the following sentences.

(i) The name given to group 7 in the periodic table is halogens.

(1)

(ii) The name given to group 0 in the periodic table is noble gases.

(1)

(b) Which of the following rows gives the colours of the group 7 elements chlorine and bromine at room temperature?

(1)

	chlorine	bromine
☒ **A**	red-brown	purple
☒ **B**	yellow-green	grey
☒ **C**	yellow-green	red-brown
☒ **D**	grey	red-brown

(c) Figure 2 shows the melting and boiling points of bromine and iodine.

element	melting point in °C	boiling point in °C
bromine	–7	59
iodine	114	184

Figure 2

Using the information in Figure 2, which row shows the physical states of these elements at 50 °C?

(1)

	bromine	iodine
☒ **A**	liquid	gas
☒ **B**	solid	liquid
☒ **C**	gas	solid
☒ **D**	liquid	solid

(d) The densities of some elements in group 0 are shown in Figure 3.

name	density in g cm^{-3}
helium	0.15
neon	1.2
argon	1.4
krypton	
xenon	3.5

Figure 3

Use the information in Figure 3 to suggest the density of krypton.

(1)

density of krypton = 2.5 g cm^{-3}

(e) For many years, argon was used to fill filament light bulbs.

A filament light bulb is shown in Figure 4.

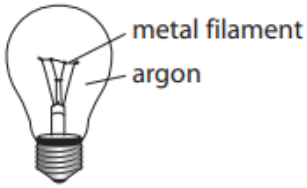

Figure 4

When the bulb is in use the metal filament becomes extremely hot.

Explain why argon, rather than air, was used to fill filament light bulbs.

(2)

Argon has a full outer shell so it is inert . It does not react with the metal filament, which reacts with oxygen if air is used to filled the light bulb.

9c

(c) Chlorine reacts with hydrogen to form hydrogen chloride.

Write the balanced equation for this reaction.

(3)

$H_2 + Cl_2 \rightarrow 2HCl$

5a, bi-ii, c

5 Chlorine, bromine and iodine are elements in group 7 of the periodic table.

(a) Chlorine is toxic.

State **one** safety precaution that should be taken when using chlorine in the laboratory.

(1)

use chlorine in a fume cardboard.

(b) Chlorine reacts with hydrogen to form hydrogen chloride.

(i) Write the word equation for this reaction.

(1)

chlorine + hydrogen → hydrogen chloride

(ii) Hydrogen chloride dissolves in water to form an acidic solution.

State what is **seen** when blue litmus paper is placed into this solution.

(1)

litmus paper turns red

(c) If chlorine solution is added to sodium bromide solution a reaction occurs.

chlorine + sodium bromide → sodium chloride + bromine

Give a reason why this reaction occurs.

(1)

chlorine is more reactive so it displaces bromine

8d, e, fi-ii

(d) Potassium reacts with fluorine to form potassium fluoride.
Potassium fluoride is a solid.

Complete the balanced equation for this reaction and add the state symbols.

(3)

2 K (S) + F_2(g) → 2 KF (S)

(e) What are the elements in group 1 of the periodic table called?

(1)

☒ **A** alkali metals

☐ **B** fullerenes

☐ **C** halogens

☐ **D** noble gases

(f) Figure 14 shows the melting points and boiling points of elements in group 7 of the periodic table.

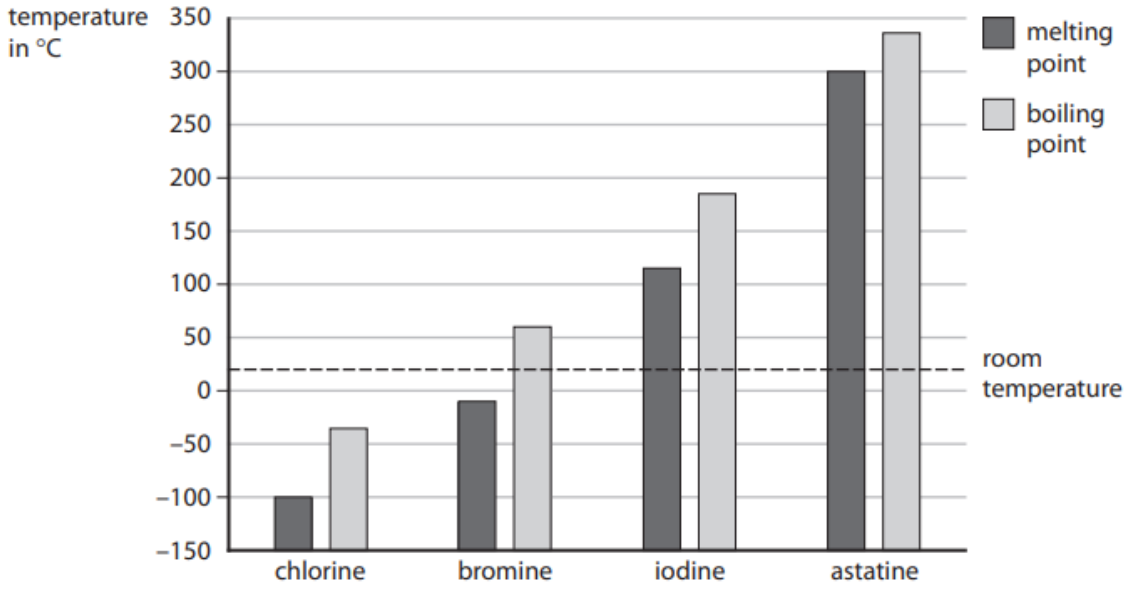

Figure 14

(i) Give, using Figure 14, the boiling point of bromine.

(1)

boiling point of bromine = 60 °C

(ii) State which **two** elements from Figure 14 are solids at room temperature.

(1)

iodine and astatine

TOTAL FOR PAPER IS 35 MARKS