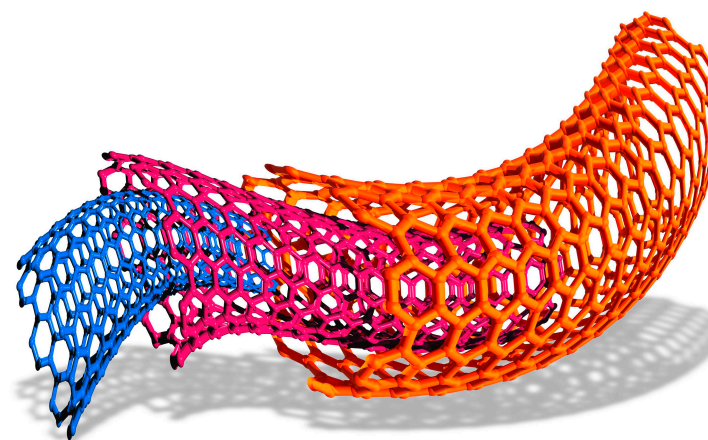


Interactive Example Candidate Responses

Paper 3 (May / June 2016), Question 5

Cambridge IGCSE™
Chemistry 0620



In order to help us develop the highest quality resources, we are undertaking a continuous programme of review; not only to measure the success of our resources but also to highlight areas for improvement and to identify new development needs.

We invite you to complete our survey by visiting the website below. Your comments on the quality and relevance of our resources are very important to us.

www.surveymonkey.co.uk/r/GL6ZNJB

Would you like to become a Cambridge International consultant and help us develop support materials?

Please follow the link below to register your interest.

www.cambridgeinternational.org/cambridge-for/teachers/teacherconsultants/

Copyright © UCLES 2017

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.

UCLES retains the copyright on all its publications. Registered Centres are permitted to copy material from this booklet for their own internal use. However, we cannot give permission to Centres to photocopy any material that is acknowledged to a third party, even for internal use within a Centre.

5 The Group VII elements are called the halogens.

(a) Describe the trends in

- the physical properties of the halogens,
- the reactivity of halogens with other halide ions.

Include a relevant word equation in your answer.

The physical properties of halogens
 - colours get darker when going down periodic table
 - used for daily appliances eg chlorine = swimming baths
 iodine = ~~test~~ medical use
 fluorine = toothpaste
Reactivity
 Group ~~VIII~~ VII is more reactive than ~~gas~~ halogens.
 Halogens are more reactive than group VI. [5]

(b) Iodine reacts with hot concentrated nitric acid.



(i) Explain why this reaction could have an adverse effect on health if not carried out in a fume cupboard.

Iodine ~~is a~~ is a good dye, so any errors may result in dying skin. [2]
 Nitric acid is also strongly acidic, etc.

(ii) Nitric acid is strongly acidic.

Which one of the following pH values represents a strongly acidic solution?

Put a ring around the correct answer,

pH 1 pH 7 pH 9 pH 13

[1]

Select
page

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(b)(iii)

Q5 Mark scheme

(a)	any 3 physical properties: <ul style="list-style-type: none"> melting point increases down the Group; boiling point increases down the Group; density increases down the Group; colour gets darker down the Group / states goes from gas to liquid to solid down the Group; reactivity: <ul style="list-style-type: none"> more reactive halogen displaces less reactive halogen (from halide); correct word equation, e.g. chlorine + potassium bromide → potassium chloride + bromine;
(b)(i)	nitrogen dioxide (formed)/NO ₂ (formed)/nitrogen oxide (formed)/gas (formed); damages lungs/irritates eyes/sore throat/skin burns/difficulty swallowing/persistent coughing/headache/vomiting;
(b)(ii)	pH 1;
(b)(iii)	zinc nitrate; water;

(iii) Nitric acid reacts with zinc oxide.

State the names of the products of this reaction.

.....Nitrate..... andZnO.....

[2]

[Total: 10]

Select
page

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(b)(iii)

Q5 Mark scheme

(a)	any 3 physical properties: <ul style="list-style-type: none">• melting point increases down the Group;• boiling point increases down the Group;• density increases down the Group;• colour gets darker down the Group / states goes from gas to liquid to solid down the Group; reactivity: <ul style="list-style-type: none">• more reactive halogen displaces less reactive halogen (from halide);• correct word equation, e.g. chlorine + potassium bromide → potassium chloride + bromine;
(b)(i)	nitrogen dioxide (formed)/NO ₂ (formed)/nitrogen oxide (formed)/gas (formed); damages lungs/irritates eyes/sore throat/skin burns/ difficulty swallowing/persistent coughing/headache/ vomiting;
(b)(ii)	pH 1;
(b)(iii)	zinc nitrate; water;

5 The Group VII elements are called the halogens.

(a) Describe the trends in

- the physical properties of the halogens,
- the reactivity of halogens with other halide ions.

Include a relevant word equation in your answer.

the lower you go
Halogens are ~~very~~ reactive but as you go down the group the lower the reactivity. for example: Chlorine is more reactive than iodine.

Halogens usually have very dark colors. for example: iodine is very black and sometimes dark green.

[5]

(b) Iodine reacts with hot concentrated nitric acid.



(i) Explain why this reaction could have an adverse effect on health if not carried out in a fume cupboard.

This reaction would have an adverse effect on health because it contains a lot of nitric acid.

[2]

(ii) Nitric acid is strongly acidic.

Which one of the following pH values represents a strongly acidic solution?

Put a ring around the correct answer.

pH 1

pH 7

pH 9

pH 13

[1]

Select
page

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(b)(iii)

Q5 Mark scheme

(a)	any 3 physical properties: <ul style="list-style-type: none">melting point increases down the Group;boiling point increases down the Group;density increases down the Group;colour gets darker down the Group / states goes from gas to liquid to solid down the Group; reactivity: <ul style="list-style-type: none">more reactive halogen displaces less reactive halogen (from halide);correct word equation, e.g. chlorine + potassium bromide → potassium chloride + bromine;
(b)(i)	nitrogen dioxide (formed)/NO ₂ (formed)/nitrogen oxide (formed)/gas (formed); damages lungs/irritates eyes/sore throat/skin burns/ difficulty swallowing/persistent coughing/headache/ vomiting;
(b)(ii)	pH 1;
(b)(iii)	zinc nitrate; water;

(iii) Nitric acid reacts with zinc oxide.

State the names of the products of this reaction.

nitric oxide and ~~zinc~~ water;

[2]

[Total: 10]

Select
page

Your
Mark

5(a)

5(b)(i)

5(b)(ii)

5(b)(iii)

Q5 Mark scheme

(a)	any 3 physical properties: <ul style="list-style-type: none">melting point increases down the Group;boiling point increases down the Group;density increases down the Group;colour gets darker down the Group / states goes from gas to liquid to solid down the Group; reactivity: <ul style="list-style-type: none">more reactive halogen displaces less reactive halogen (from halide);correct word equation, e.g. chlorine + potassium bromide → potassium chloride + bromine;
(b)(i)	nitrogen dioxide (formed)/NO ₂ (formed)/nitrogen oxide (formed)/gas (formed); damages lungs/irritates eyes/sore throat/skin burns/ difficulty swallowing/persistent coughing/headache/ vomiting;
(b)(ii)	pH 1;
(b)(iii)	zinc nitrate; water;

Cambridge Assessment International Education
The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA, United Kingdom
t: +44 1223 553554
e: info@cambridgeinternational.org www.cambridgeinternational.org

Copyright © UCLES September 2017