

1. **June/2022/Paper_11/No.30**

Element Y is in Period 3 of the Periodic Table. It forms a chloride that is a liquid at room temperature.

Which row shows correct information about the group number and the nature of the oxide of element Y?

	group number	nature of oxide
A	I	basic
B	II	acidic
C	IV	amphoteric
D	VI	acidic

2. **June/2022/Paper_11/No.31**

Which gases are used in light bulbs?

- 1 argon
- 2 oxygen
- 3 neon

A 1 only **B** 1 and 2 only **C** 1 and 3 only **D** 1, 2 and 3

3. **June/2022/Paper_12/No.31**

Selenium is in Group VI and gallium is in Group III.

Which prediction can be made from this information?

- A** A gallium atom has three more protons than a selenium atom.
- B** Gallium is more likely to form negative ions than selenium.
- C** Selenium atoms have fewer valence electrons than gallium atoms.
- D** Selenium has more non-metallic character than gallium.

4. **June/2022/Paper_12/No.32**

Which statement about some metals and their compounds is correct?

- A** Calcium reacts with cold water but not with steam.
- B** Lead carbonate decomposes at a higher temperature than zinc carbonate.
- C** Magnesium can be extracted from its oxide by heating strongly with carbon.
- D** Pure aluminium reacts with cold, dilute hydrochloric acid.

The table shows some information about elements in Group VI.

element	electronic configuration	melting point /°C	density in g/cm ³
oxygen	2, 6	-218	0.0013
sulfur		113	2.1
selenium	2, 8, 18, 6	217	4.8
tellurium	2, 8, 18, 18, 6	450	6.3
polonium	2, 8, 18, 32, 18, 6	254	

(a) State the electronic configuration for sulfur.

..... [1]

(b) Predict the density of polonium.

..... g/cm³ [1]

(c) Sulfur has a boiling point of 445 °C.

Predict the physical state of sulfur at 200 °C.

Explain your answer.

physical state

explanation

[1]

(d) Oxygen exists as a diatomic molecule, O₂.

(i) Draw the dot-and-cross diagram for a molecule of oxygen.

Show only the outer shell electrons.

[1]

(ii) Explain, in terms of structure and bonding, why oxygen has a low melting point.

.....
..... [1]

(e) Selenium, Se, is a non-metal.

(i) Deduce the formula of selenium(IV) oxide.

..... [1]

(ii) A small sample of selenium(IV) oxide is dissolved in water.

Two drops of universal indicator are added to this aqueous solution.

Predict the colour of the universal indicator in this solution.

Explain your answer.

colour

explanation

..... [1]

(f) Calculate the volume, in dm^3 , of 30.2 g of oxygen at room temperature and pressure.

Give your answer to **two** significant figures.



volume dm^3 [3]

[Total: 10]