Q1.

This question is about Period 3 elements and their oxides.

(a) Give an equation for the reaction between phosphorus and an excess of oxygen.

_____

(1)

(b) Give an equation for the reaction between sulfur dioxide and water.

_____

(1)

(c) Give the displayed formula for the anion formed when sulfur trioxide reacts with water.

(1)

(d) Give an equation for the reaction of magnesium with steam.

State one observation made.

Equation

_____

Observation _____

_____

(2)

(e) Give an equation to show how an excess of magnesium oxide reacts with phosphoric acid (H_3PO_4).

_____

(1)

(Total 6 marks)

Q2.

This question is about Period 3 elements and their compounds.

(a) Which is **not** a correct statement about magnesium hydroxide?

Tick (✓) **one** box.

It is used to neutralise stomach acid ☐

It forms a solution with pH = 14 at 25 °C ☐

It has the empirical formula H_2MgO_2 ☐

(1)

(b) Give an equation for the reaction of aluminium oxide with sulfuric acid.

_____

(1)

(c) Identify a reagent or test that could be used to distinguish between aqueous solutions of sulfur dioxide and sulfur trioxide with the same concentrations.

State the observation in each case.

Reagent or test _____

Observation with sulfur dioxide solution _____

_____

Observation with sulfur trioxide solution _____

_____

(3)

(d) The mass spectrum of the element phosphorus has a peak at $\frac{m}{z}$ = 124

Give the formula of the species responsible for this peak.

_____

(2)

(e) Give an equation for the reaction of phosphorus(V) oxide with sodium hydroxide solution.

_____

(1)

(f) Draw the displayed formula of the molecule formed when phosphorus(V) oxide reacts with water.

(1)

(g) The table below shows the melting points of three substances.

Substance	Melting point / K
sodium chloride	1074
chlorine	172
hydrogen chloride	158

Explain why the melting points of these substances are different.

You should refer to the structure of and bonding in each substance.

(6)

(Total 15 marks)