



CHEMISTRY ONLINE
— **TUITION** —

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CHEMISTRY

PHYSICAL CHEMISTRY

LEVEL & BOARD:	OCR (AS - LEVEL)
TOPIC:	Atoms, Amount, Equation & Reactions
PAPER TYPE:	QUESTION PAPER 2
TOTAL QUESTIONS	07
TOTAL MARKS	17

Compounds, Formulae and Equations

1. A chemist carries out reactions involving sulfur dioxide (SO_2) and sulfur trioxide (SO_3).

Reaction 1: Sulfur dioxide is reacted with water, forming an acidic solution.

Reaction 2: Sulfur trioxide is reacted with water, forming a strong acid.

- i. Write equations for Reaction 1 and Reaction 2.

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[3]

- ii. Predict the structure and bonding of SO_3 .

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[1]

- iii. SO_3 forms sulfuric acid (H_2SO_4) when reacted with water.

Suggest a 'dot-and-cross' diagram for the structure of the sulfate ion (SO_4^{2-}) found in sulfuric acid.

Show outer shell electrons only.

[1]

2. Bromine and mercury react with many elements and compounds. Predict the formula of the compound formed when bromine reacts with sodium.

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[1]

3. This question is about inorganic compound

(a) Silver nitrate, AgNO_3 , reacts with sodium chloride, NaCl , in aqueous solution.

A student mixes a solution of AgNO_3 with an equal volume of NaCl solution.

- i. Describe what the student would observe during this reaction.

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[1]

- ii. Write the equation for the reaction between AgNO_3 and NaCl .

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[1]

(b) Compounds of potassium have many uses.

- i. Identify a compound of ammonium ions that could be used to fertilize acidic soil with a pH of 4.2 and raise it to pH 6.8.

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[1]

- ii.** Potassium bromide, KBr, is an ionic compound used in photography. Potassium bromide can be prepared by reacting potassium metal with bromine, Br₂.
Write the equation for the reaction of potassium with bromine to form potassium bromide.

[1]

- iii.** Draw a 'dot-and-cross' diagram to show the bonding in potassium bromide, KBr. Show outer electrons only.

[2]

- 4.** Chlorine, with an atomic number of 17, is in Period 3 of the Periodic Table. Chlorine is a Group 7 element.

Predict the formula of a chloride ion.

[1]

- 5.** This question is about compounds of Group 3 elements. Boron will combine directly with oxygen.

Write the equation for the reaction between boron and oxygen.

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[1]

6. A molecule of an alkane has 16 carbon atoms. State the empirical formula of this alkane.

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[1]

7. A salt has the empirical formula Na_3PO_4 . Suggest the formulae of the ions present in this salt.

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[2]



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- Founder & CEO of Chemistry Online Tuition Ltd.
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