

Phone: +442081445350 www.chemistryonlinetuition.com Email: asherrana@chemistryonlinetuition.com

## **CHEMISTRY**

## PHYSICAL CHEMISTRY

LEVEL & BOARD:	OCR (AS - LEVEL)
TOPIC:	Atoms, Amount, Equation & Reactions
PAPER TYPE:	QUESTION PAPER 1
TOTAL QUESTIONS	07
TOTAL MARKS	17

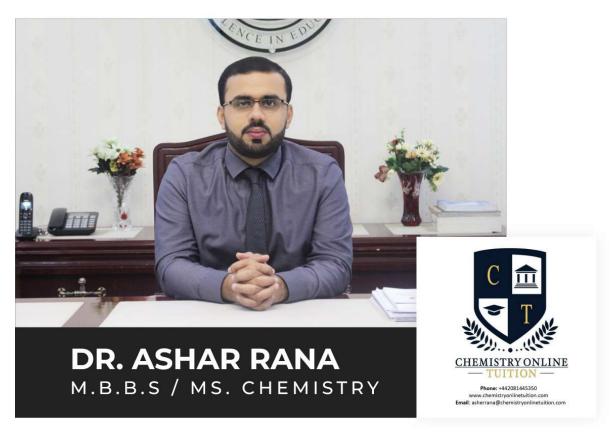
## Compounds, Formulae, and Equations

1.	Indium, atomic number 24, is in Period 4 of the Periodic Table.  Indium is a Group 3 element. Predict the formula of a Indium ion.		
		[1]	
2.	A che	emist carries out reactions of magnesium and magnesium oxide, MgO.	
		tion 1: Magnesium is reacted with water. tion 2: Magnesium oxide is reacted with hydrochloric acid, forming a salt, r.	
		tion 3: Magnesium is reacted with an excess of nitrogen at 800°C, forming nesium nitride, $Mg_3N_2$ .	
	i.	Write equations for Reaction 1 and Reaction 2.	
		[3]	
	ii.	Predict the structure and bonding of Mg <sub>3</sub> N <sub>2</sub> .	
		[1]	
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	iii.	MgO formed in Reaction 3 contains magnesium and oxide ions. The oxide ion has the structure [O] <sup>2-</sup> .	
		Suggest a 'dot-and-cross' diagram for MgO. Show outer shell electrons only.	

			[1]
3.		ne and aluminum react with many elements and compounds.  It the formula of the compound formed when chlorine reacts wounds.	ith
			[1]
4.	This	uestion is about inorganic compound	
	re	ad chloride, $PbCl_2$ , reacts with concentrated sulfuric acid. A stude acts a sample of $PbCl_2$ with an excess of concentrated sulfuric acid in st-tube.	
	i.	Describe what the student would observe during this reaction.	
			[1]
	ii.	Write the equation for the reaction between $PbCO_3$ and concentratinitric acid.	

	[1]
(b)	Compounds of potassium have many uses.
i.	Identify a compound of potassium that could be used as a fire suppressant.
	[1]
ii.	Potassium sulfide, $K_2S$ , is an ionic compound used in wastewater treatment. Potassium sulfide can be prepared by reacting potassium metal with sulfur, $S_8$ .
	Write the equation for the reaction of potassium with sulfur to form potassium sulfide.
	[1]
iii.	Draw a 'dot-and-cross' diagram to show the bonding in potassium sulfide, $K_2S$ .
	[2] Show outer electrons only.

5.	This question is about compounds of Group 5 elements. Phosphorus will combine directly with chlorine.
	Write the equation for the reaction between phosphorus and chlorine.
6.	[1] A molecule of an alkene has 12 carbon atoms. State the empirical formulae of this alkene.
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7.	A salt used as a food preservative has the empirical formula $Na_3C_6H_5O_7$ . Suggest the formulae of the ions present in this salt.
	[2]



- · Founder & CEO of Chemistry Online Tuition Ltd.
- · Completed Medicine (M.B.B.S) in 2007
- Tutoring students in UK and worldwide since 2008
- · CIE & EDEXCEL Examiner since 2015
- · Chemistry, Physics, Math's and Biology Tutor

## CONTACT INFORMATION FOR CHEMISTRY ONLINE TUITION

- · UK Contact: 02081445350
- · International Phone/WhatsApp: 00442081445350
- · Website: www.chemistryonlinetuition.com
- · Email: asherrana@chemistryonlinetuition.com
- · Address: 210-Old Brompton Road, London SW5 OBS, UK