

AQA – Properties of Period 3 elements and their oxides – A2 Chemistry P11. **No.3**

0	3
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This question is about elements in Period 3 and their compounds.

0	3	.	1
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When a piece of sodium is added to 200 cm³ of water in a large beaker a vigorous reaction occurs. The temperature of the water increases by 25 °C

Give an equation, including state symbols, for the reaction of sodium with water.

Suggest why it is dangerous to react a similar piece of sodium with 10 cm³ of water in a boiling tube.**[2 marks]**

Equation

Why it is dangerous

0	3	.	2
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Give an equation for the reaction of phosphorus(V) oxide with water.

Suggest a pH for the solution formed.

[2 marks]

Equation

pH

0	3	.	3
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Explain, in terms of crystal structure and bonding, why silicon(IV) oxide has a higher melting point than phosphorus(V) oxide.

[4 marks]

0	3	.	4
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An element in Period 3 forms an oxide that is insoluble in water.
This oxide reacts with sulfuric acid and with aqueous potassium hydroxide.

Give the formula for this oxide.

Give an equation for the reaction of this oxide with sulfuric acid.

[2 marks]

Formula _____

Equation _____

0	3	.	5
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Give the formula of a hydroxide of an element in Period 3 used in medicine.

[1 mark]

0	3	.	6
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Identify the element in Period 3, from sodium to chlorine, that has the largest atomic radius.

[1 mark]

2. No.2

0 2

This question is about oxides.

0 2 . 1

Sodium oxide forms a solution with a higher pH than magnesium oxide when equal amounts, in moles, of each oxide are added separately to equal volumes of water.

State why both oxides form alkaline solutions.

Suggest why sodium oxide forms a solution with a higher pH than the solution formed from magnesium oxide.

[2 marks]

0 2 . 2

Give an equation for the reaction between phosphorus(V) oxide and water.

[1 mark]

0 2 . 3

In the Contact process, sulfur(IV) oxide is converted into sulfur(VI) oxide using vanadium(V) oxide as a catalyst.

Give **two** equations to show how the vanadium(V) oxide acts as a catalyst in this process.

[2 marks]

Equation 1 _____

Equation 2 _____