

Magnesium and oxygen reaction equation: Johnstone's triangle

Learning objectives

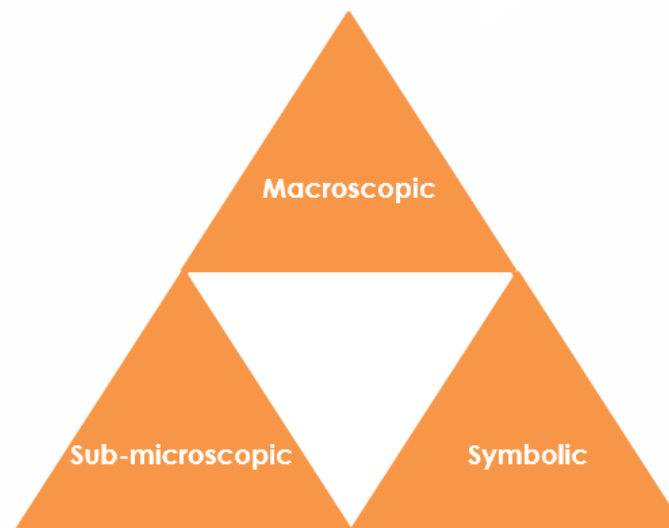
- 1 Describe the appearance of the magnesium oxide product.
- 2 Recognise that (s) can represent a solid in the form of smoke.
- 3 Explain why the formula MgO_2 is incorrect.

Introduction

The reaction between magnesium and oxygen can be represented as a balanced chemical equation. State symbols give the state of each reactant and product.

Johnstone's triangle

In chemistry we make sense of the things that we can see by representing what we can't see using formulas, equations, diagrams and models.



Johnstone's triangle is a way of thinking about these different concepts as different corners of a triangle:

- Macroscopic – what we can see. Think about the properties we can observe, measure and record.
- Sub-microscopic – smaller than we can see. Think about the particle or atomic level.
- Symbolic – representations. Think about how we represent chemical ideas, including symbols and diagrams.

Being able to connect and move between these three different levels is important for scientific understanding.

Macroscopic – what we can see

Magnesium burns with a bright white flame forming white smoke and a white solid.

Name the gas in the air that reacts with magnesium.

Describe the appearance of the magnesium oxide.

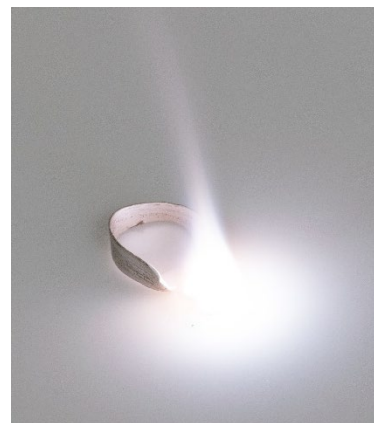
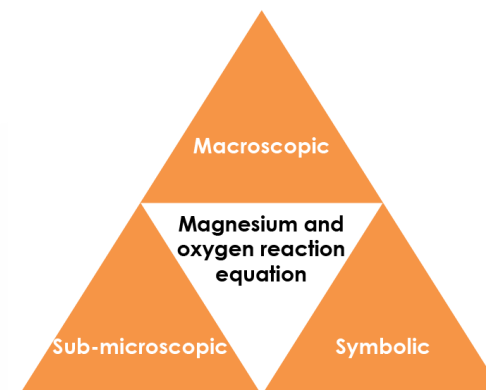


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**Sub-microscopic – smaller than we can see**

Magnesium oxide is an ionic compound.

Give the symbol and charge of each ion.

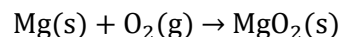
magnesium ion _____ oxide ion _____

Complete the sentence to describe what is shown by the chemical formula MgO.

For every magnesium ion in the lattice there is _____ oxide ion.

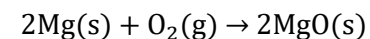
Explain why the overall charge of magnesium oxide is zero.

Explain why the following equation cannot be correct.



Symbolic – representations

Give the chemical symbol or formula of each reactant and product in the equation:



magnesium _____

oxygen _____

magnesium oxide _____

Explain why the state symbol of the magnesium oxide produce is (s).
