**Burning sulfur**

1. A gas jar contains pure oxygen.

A small piece of heated sulfur is lowered into the gas jar.

The sulfur burns brightly.



What substance (or substances) are produced?

A CO2 + H2O

B SO2 only

C CO2 + H2O +SO2

*Chemistry > Big idea CCR: Chemical reactions > Topic CCR2: Understanding reactions > Key concept CCR2.2: Combustion*

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| **Response activity** |
| **Burning sulfur** |

**Overview**

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| Learning objective: | During combustion new products are formed form the combination of oxygen with the fuel, resulting in an increase in measured mass. |
| Observable learning outcome: | Explain the products of combustion of a fuel. |
| Activity type: | application and practice |
| Key words: | substance |

This activity can help develop students’ understanding by addressing the misunderstanding revealed by the following diagnostic question(s):

* Sulfur impurity

**What does the research say?**

Johnston (1991) describes the difficulties of students in switching between macroscopic, sub-microscopic and symbolic levels of thought.

This question requires students to apply sub-microscopic thinking in order to work out that if only sulfur atoms are present then there will only be one product of combustion of sulfur (sulfur dioxide).

**Ways to use this activity**

This experiment may be demonstrated but it is essential to check up-to-date safety advice. Sulfur dioxide gas is produced during the reaction which must not be inhaled. A fully functioning fume cupboard MUST be used.

Practical work should be carried out in accordance with local health and safety requirements, guidance from manufacturers and suppliers, and guidance available from CLEAPSS.

This activity gives students the opportunity to practise applying their understanding and to clarify their thinking through discussion. To support this, students should answer the question in pairs or small groups. The answer from the associated diagnostic question (Sulfur impurity) is not correct in this example so students will need to think about what is different, before applying their understanding of the rearrangement of atoms.

Listening to individual groups as they work often highlights any difficulties they might have. These can often be overcome, through a whole class clarification or redirection part way through the activity.

**Expected answers**

B

**Acknowledgments**

Developed by Helen Harden (UYSEG).

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**References**

Johnstone, A. H. (1991). Why is chemistry difficult to learn? Things are seldom what they seem. *Journal of Computer Assisted Learning,* 7**,** 75-83.