

0 1

Fuels from crude oil burn to provide heat energy.

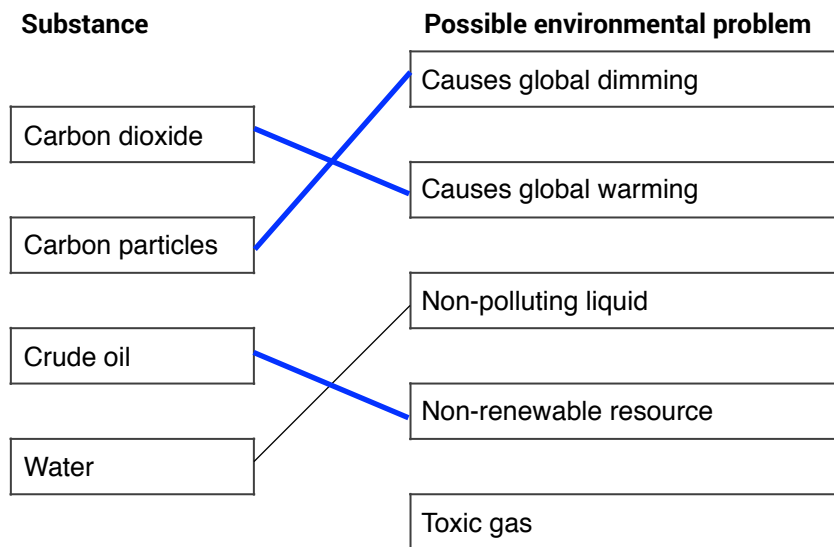
When a fuel burns, it combines with oxygen in the air and produces carbon dioxide and water. When there is not enough oxygen, the fuel burns and also produces carbon monoxide and carbon particles.

0 1 . 1

Draw a straight line from each substance that links it to a possible environmental problem.

[3 marks]

One has been done for you.



0 2

Sulfur is a non-metal.

Sulfur burns in the air to produce sulfur dioxide,  $\text{SO}_2$

0 2 . 1

Why is it important that sulfur dioxide is **not** released into the atmosphere?

[1 mark]

Tick (✓) **one** box.

- Sulfur dioxide causes acid rain.
- Sulfur dioxide causes global dimming.
- Sulfur dioxide causes global warming.

0 2 . 2

Sulfur dioxide dissolves in water.

What colour is universal indicator in a solution of sulfur dioxide?

Give a reason for your answer.

[2 marks]

Colour..... red (allow orange / yellow) [1]

Reason..... sulfur dioxide is acidic [1]

Sulfur dioxide is a gas at room temperature.

The bonding in sulfur dioxide is covalent.

|   |   |   |   |
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Explain, in terms of its structure and bonding, why sulfur dioxide has a low boiling point.

[3 marks]

*(there are) weak forces (of attraction) [1]*  
*do not accept any reference to covalent bonds breaking*

*between the molecules [1]*  
*do not accept any other particles*

*(these) take little energy to overcome [1]*  
*award third mark only if first mark given*

**WARNING:**

In the exam, you will need to be prepared to answer questions from other related topics. Questions about structure and bonding are often linked to questions that seem to be about other aspects of Chemistry.

(Total 9 marks)

End