

# Worksheet 7.5

## Energy changes during combustion

**1** In the laboratory, a Bunsen burner is used as a heat source. The gas which is burnt in a Bunsen burner is called methane.

**a** When methane is burnt heat energy is released into the surroundings. What name is given to this type of reaction?

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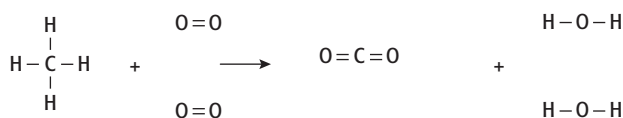
**b** Methane is called a non-renewable fuel. Explain what is meant by a non-renewable fuel.

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**c** Name two fuels which are renewable.

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**2** The reaction between methane (CH<sub>4</sub>) and oxygen (O<sub>2</sub>) which takes place during burning produces carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O). It may be represented using the following display formulae.



**a** Which two different bonds are broken during the reaction?

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**b** Which two bonds are made during the reaction?

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**c** Calculate the overall energy change for the reaction (heat of reaction) between methane and oxygen. The bond energies are:

C—H = 435 kJ/mol      O=O = 497 kJ/mol      C=O = 803 kJ/mol      H—O = 464 kJ/mol

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