Answer sheet

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IG Teaching Hubs Chemistry Worksheets

Lesson 75 – Worksheet 1

**1** Methane is obtained from the refinery gases **fraction**. It is defined as a **fuel** because energy is released when it is burned. Burning is an **oxidation** reaction which also known as combustion. **Complete** combustion is when a substance burns in plenty of air or oxygen.

The products formed during the complete combustion of methane are carbon dioxide and **water**. The word equation is: methane  oxygen → carbon dioxide  water

Energy is also transferred by heat and **light** to the surroundings during the combustion of methane.

**2 a** C2H4  3O2 → 2CO2  2H2O

**b** C3H8  5O2 → 3CO2  4H2O

**c** 2C4H10  13O2 → 8CO2  10H2O

**d** C5H12  8O2 → 5CO2  6H2O

Lesson 75 – Worksheet 2

**1** Methane is obtained from the refinery gases **fraction**. It is defined as a **fuel** because energy is released when it is burned. Burning is an **oxidation** reaction which also known as combustion. **Complete** combustion is when a substance burns in plenty of air or oxygen.

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Lesson 75 – Worksheet 3

**1 a** C2H6  2O2 → C  CO  3H2O

**b** C4H8  3O2 → 2C  2CO  4H2O

**2** If gasoline is burned in a limited supply of oxygen or air, **incomplete** combustion occurs producing carbon and carbon **monoxide**. It is possible to tell that carbon is being released by seeing the release of smoke and **soot**. This can cause:

* blackened **surfaces**
* blocked chimneys and flues
* **breathing** problems
* global dimming.

Carbon monoxide is produced as the carbon atoms from the gasoline are only partially **oxidised**. Electronic carbon monoxide **detectors** are needed near gas appliances because we cannot see or **smell** carbon monoxide. We need to know if carbon monoxide is being produced as it can cause unconsciousness and even **death**. This happens because as carbon monoxide is breathed in, it gets into the bloodstream and combines with **haemoglobin** in the red blood cells. This reduces the amount of **oxygen** carried in the blood.

**3 a** limited

**b** incomplete

**c** less

**4**

|  |  |
| --- | --- |
| Possible problem | Caused by carbon particles (✓) |
| smoke and soot formed | ✓ |
| surfaces become damp |  |
| surfaces become black or dirty | ✓ |
| enhanced greenhouse effect |  |
| may cause breathing problems | ✓ |
| flue pipes from boilers get blocked | ✓ |

Lesson 75 – Worksheet 4

**1 a** C2H6  2O2 → C  CO  3H2O

**b** C4H8  3O2 → 2C  2CO  4H2O

**2** If gasoline is burned in a limited supply of oxygen or air, **incomplete** combustion occurs producing carbon and carbon **monoxide**. It is possible to tell that carbon is being released by seeing the release of smoke and **soot**. This can cause:

* blackened **surfaces**
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* **breathing** problems
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Carbon monoxide is produced as the carbon atoms from the gasoline are only partially **oxidised**. Electronic carbon monoxide **detectors** are needed near gas appliances because we cannot see or **smell** carbon monoxide. We need to know if carbon monoxide is being produced as it can cause unconsciousness and even **death**. This happens because as carbon monoxide is breathed in, it gets into the bloodstream and combines with **haemoglobin** in the red blood cells. This reduces the amount of **oxygen** carried in the blood.

**3 a** limited

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|  |  |
| --- | --- |
| Possible problem | Caused by carbon particles (✓) |
| smoke and soot formed | ✓ |
| surfaces become damp |  |
| surfaces become black or dirty | ✓ |
| enhanced greenhouse effect |  |
| may cause breathing problems | ✓ |
| flue pipes from boilers get blocked | ✓ |

IG Teaching Hubs Chemistry Homework sheets

Lesson 75 – Homework

**1** Table completed correctly, e.g.

|  |  |  |
| --- | --- | --- |
|  | Complete combustion | Incomplete combustion |
| **Blue flame** | ✓ |  |
| **Luminous orange flame** |  | ✓ |
| **Hottest flame** | ✓ |  |
| **Air hole closed** |  | ✓ |

**2 a** carbon dioxide; water

**b** methane  oxygen → carbon dioxide  water

**c** Two from: heating; light; sound/movement.

**3 a** If the supply of air/oxygen is limited.

**b** Two from: smoke produced; soot produced; orange flame colour (due to hot carbon particles glowing).

**c** Two from: blackened/dirty surfaces; chimneys/flues blocked; breathing problems; causes fires.

**d** Carbon atoms; in the hydrocarbon fuel; are only partially oxidised/not fully oxidised.

**4 a** To warn if carbon monoxide is being produced; because we cannot see or smell it; and it causes unconsciousness/death

**b** Carbon monoxide is breathed in; gets into the bloodstream; combines with haemoglobin in the red blood cells; reduces amount of oxygen carried in the blood.

**5** Answer could include these points: nest reduces the amount of oxygen/air getting in; so incomplete combustion happens; carbon/ soot produced; surfaces get dirty; breathing problems; reduces the amount of waste gases getting out; carbon monoxide gets into house; carbon monoxide is toxic.