

01

Coal contains sulfur impurities. Burning coal releases sulfur dioxide gas into the atmosphere.

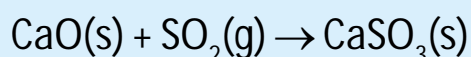
- (a) Sulfur dioxide is an air pollutant. Explain how sulfur dioxide affects the environment.
- (b) One way to remove sulfur dioxide is to scrub the flue gas before releasing the gas into the atmosphere.
- (i) Name a chemical substance needed for this process.
- (ii) Explain the action of this substance in removing sulfur dioxide.

(a) Sulfur dioxide dissolves in rain water to form acid rain. Acid rain corrodes steel structures and concrete buildings, kills forests due to the increased acid level in soil and marine lives due to the increased acidity in lakes and rivers.

- (b) (i) Calcium carbonate (limestone)
- (ii) Powdered limestone is injected into the combustion chamber. The limestone decomposes to calcium oxide (lime) and carbon dioxide.



The lime combines with the sulfur dioxide to form calcium sulfite.



02 W is a fossil fuel. It formed from the remains of tiny sea animals and plants that lived millions of years ago. X is the major component of W. W is also used as a source of gas Y. W in the form of Z is used as a fuel in motor vehicles.

- (a) Write the name of a fossil fuel W formed naturally.
- (b) Gas X is a major component of fossil fuel W. What is the name of gas X ?
- (c) What is the name of gas Y that is also used as a source of gas X ?
- (d) W is a fossil fuel from which gas Z is obtained that is used as a fuel in motor vehicles.

- (a) Fossil fuel W is natural gas formed naturally from the petrified and dead remains of sea animals and plants long ago.
- (b) Gas X is methane, a major component of fossil fuel W.
- (c) Gas Y is Hydrogen.
- (d) Gas Z is CNG. It is used as a fuel in motor vehicles.

03 Fossil fuels are a combination of energy rich compounds. It has elements X and Y which were originally made by the plants with the help of sun's energy.

- (a) Name the element X.
- (b) Name another element Y which is usually found in combination with X in fossil fuels.
- (c) Write the common name representing elements X and Y.
- (d) In which form or forms fossil fuels are obtained.

- (a) Element X is Carbon.
- (b) Another element (Y) found usually in combination with element (X) carbon in fossil fuels is Hydrogen.
- (c) The common name representing elements X and Y is Hydrocarbons.
- (d) Fossil fuels are obtained in solid form as coal, liquid form as petroleum and gaseous form as natural gas.

04

LPG is a mixture of several hydrocarbons or gases. It is a by product obtained from petroleum refineries by fractional distillation. The mixture of above hydrocarbons or gases are liquefied under ordinary or atmospheric pressure to fill in cylinders for domestic and industrial use. A substance X is added to LPG cylinders while filling so as to make the detection of leakage of LPG from the cylinders easy.

- (a) Write the name of main gas present in petroleum gas or LPG.
- (b) What are the other gases present in LPG ?
- (c) Name the substance X.
- (d) How does substance X make the detection of leakage of LPG easy ?

- (a) The main gas present in the petroleum gas or LPG is Butane.
- (b) The other gases present in LPG are propane and ethane.
- (c) Substance X is Ethyl mercaptan.
- (d) Ethyl mercaptan has a foul smell which can be detected easily, when added to LPG gas while filling LPG in cylinders.

05

When a material P mined from the earth is heated strongly in an insufficient supply of air, it produces a solid fuel Q which consists mainly of carbon. When another material R obtained from trees is heated in an insufficient supply of air, it produces another solid fuel S which also consists mainly of carbon.

- (a) What is material P ?
- (b) What is solid fuel Q ?
- (c) When another material R obtained from trees is heated in an insufficient supply of air, which product is formed ?
- (d) Name another solid fuel S obtained after processing R ?

- (a) Material P is coal as it is mined from the earth.
- (b) Material P i.e., coal obtained from the mines is heated strongly in an insufficient supply of air to produce Q-coke. So, solid fuel Q is coke.
- (c) Material R is wood.
- (d) Material S is charcoal which consists mainly of carbon.