

Heep Woh College
F.4 Combined Science (Chemistry Part) Reading Assignment 1

Group Name: _____

Class: 4 ()

Group Member: 1. _____ () 2. _____ ()

3. _____ () 4. _____ ()

Part I: Read the following passage and answer the questions below.

Use of Oxygen for Medicinal Purposes

Oxygen is a component of the air we breathe, For the large-scale production of oxygen, the two most commonly used methods are the electrolysis of an solution of dilute sulphuric acid and the fractional distillation of liquid air.

About 25% of all patients entering an acute care hospital receives inhaled oxygen during their stays in hospitals. Since air already contains 21 % of oxygen by volume, the inhaled oxygen in hospitals is actually supplementary oxygen. Its concentration is higher than the 21% in the air.

In hospitals, pure oxygen is piped into patients' rooms and is ready for delivery at a specific concentration needed. The equipment used (eg. two-pronged nasal tubes, oxygen masks. Trans-tracheal catheters and oxygen tents) determines the actual percentage of oxygen delivered. The equipment mixes pure oxygen from the wall-mounted oxygen supply with the ordinary air in different proportions. The percentage of oxygen delivered to the patient can range from just above 21% to over 90% by volume.

The percentage of oxygen used depends on the clinical conditions of the patient, In general, the lower the oxygen content in a patient, the higher the concentration of oxygen is needed. Higher concentration of oxygen is only used in the intensive care unit. To minimize the risk of oxygen intoxication, doctors try to keep the oxygen concentration not over 40%. .

Oxygen therapy is used either in short-term treatment for people recovering from acute lung disorders (eg. pneumonia, asthma and gas poisoning) or in long-term treatment for people with chronic lung disorders. Moreover, oxygen can act as an anaesthetic when mixed with nitrous oxide, ether vapour, etc. In addition, oxygen is often mixed with carbon dioxide to stimulate breathing and restore respiration in cases of poisoning and collapse.

Question:

1. Apart from fractional distillation of liquid air, what is the usual way of producing oxygen on a large scale?

2. What is the characteristic of the inhaled oxygen in hospitals?

3. List three pieces of equipment which provide oxygen in the hospitals

4. Why do doctors usually keep the oxygen concentration not higher than 40 % when delivering oxygen to patients?

5. State three medical uses of oxygen.

6. What would be the situation if the composition of air had not been separated and identified by chemists? (Hint: Refer to the applications of the gases in the air.)

End of Part I

Part II: Read the following passage and answer the questions below.

Fresh water from sea water

The following table shows the different categories of water on Earth:

Different categories of water on Earth	
Category of water	Percentage
Sea	97.4%
ice-caps, glaciers and groundwater (fresh water)	2.59%
Lakes, rivers, atmosphere and soil moisture (fresh water)	0.01 %

People living in developed countries have access to high quality drinking water. However, more than a billion people on Earth (one in six) lack access to drinking water. In the Middle East, fresh water is scarce whilst sea water is readily available in many areas. However, sea water is not suitable for human consumption.

Obtaining fresh water from sea water

One possible method of converting sea water into fresh waer is by removing the dissolved salts. The process is called desalination.

Two methods of desalination are thermal distillation and reverse osmosis

Osmosis is the natural tendency for a solvent (water in this case) to move through a membrane from a region of higher solvent concentration to a region of lower solvent concentration. However, osmosis can be reversed. If sufficient pressure is applied to the sea water side, sea water can be forced through a series of membranes contain tiny pores that allow the smaller water molecules to pass but prevent larger particles of contaminants. This is the basic principle of desalination by reverse osmosis.

Reverse osmosis currently represents around 60% of the global desalination market. It is predicted that this will increase to 65% by 2015.

The world's largest producer of desalination water — Saudi Arabia

Desalination meets 70% of the drinking water requirements in Saudi Arabia. Several new desalination plants are under construction. Once completd, the countrys network of desalination plants will have a capacity of 800 million gallons a day.

Question:

1. Instead of importing water from Guangdong province, desalination is an alternative means of providing fresh water to Hong Kong. Discuss the pros and cons of using this alternative.

2. Fresh Water is a precious resource. Suggest how you can help save it.

The End