

UNIT

11

AIR



Learning Objectives

After the completion of this lesson, students will be able to:

- ◆ know about the occurrence and composition of oxygen, nitrogen and carbon dioxide in the atmosphere.
- ◆ understand the properties and uses of oxygen, nitrogen and carbon dioxide.
- ◆ understand nitrogen fixation.
- ◆ identify the causes of green house effect, global warming and acid rain.
- ◆ suggest remedial measures for the prevention and control of these effects.



Introduction

Air is a mixture of gases that surrounds our planet earth. It is essential for the survival of all the living things. Air contains 78.09% nitrogen, 20.95% oxygen, 0.93% argon, 0.04% carbon dioxide and small amount of other gases. We breathe in oxygen and breathe out carbon dioxide. Plants in turn use carbon dioxide for photosynthesis and release oxygen into the atmosphere. Since men have been cutting down trees for their needs, the amount of carbon dioxide in the atmosphere is increasing. This is responsible for the raising of atmospheric temperature. Industries and vehicles release gases like carbon monoxide and sulphur dioxide into the atmosphere. This has resulted in effects like global warming and acid rain which affect us in many ways. In total, the quality of air is gone in the modern days. In this lesson we are going to study about the effects like green house effect, global warming and acid rain. We will also study about occurrence and properties of the gases oxygen, nitrogen and carbon dioxide.

11.1 Oxygen

All living things in the world need oxygen. We cannot imagine the world without oxygen. Swedish chemist C.W. Scheele first discovered oxygen in 1772. He called the gas **fire air** or **vital life** because it was found to support the process of burning. It was independently discovered by the British scientist Joseph Priestley in 1774. Lavoisier named oxygen. The name oxygen comes from the Greek word 'oxygenes' which means 'acid producer'. It is called so because early chemists thought that oxygen is necessary for producing acids.

11.1.1 Occurrence of Oxygen

Oxygen is the most abundant element on the earth by mass and the third most abundant element after Hydrogen and Helium in the universe. It occurs both in free state and combined state. It is present in free state as diatomic molecule (O_2) in the atmosphere. Most of this has been produced by photosynthesis in which the chlorophyll present in the leaves of plants uses solar energy to produce glucose.