

20.5 THE SULPHUR CYCLE

Major reserves of sulphur on Earth's crust are deposits of sulphide and sulphates while organic sulphur it occurs in bodies of all living being. Plant and animal secretions and decomposition of dead organic matter yields hydrogen sulphide gas, which is converted to sulphates by bacterial action. Plants take up sulphur as sulphates. Bacterial action may turn some sulphates to hydrogen sulphide which is changed to sulphates again. A simplified sulphur cycle is presented in Fig 20.4. Sulphur in coal and petroleum yields sulphur dioxide gas upon combustion. A number of metals occur as sulphide or sulphate deposits which during their mining and processing operations give rise mostly to sulphur dioxide gas. Sulphur dioxide is changed to corresponding acid which, finally, yields sulphates which are ultimately added to the sulphate content of the environment. Some sulphur is also added to the soil or to aquatic system as a result of volcanic activity.

There are two major factors contributed by human being, which disturb the natural sulphur cycle. Combustion of fossil fuels yields an enormous amount of sulphur dioxide worldwide.

It is the injection of sulphur into the atmosphere, which has been causing great concern. A lot of sulphur is added to atmosphere as a result of mining and processing operations during extraction of metals. Volcanic emissions, which are the only known natural source of sulphur dioxide, have been estimated to contribute 2×10^9 to 5×10^9 kg of sulphur per year, while the annual amount of industrial sulphur injected into the atmosphere is thought to be about 83×10^9 kg. Sulphur dioxide is a serious local pollutant with a wide range of harmful effects. This gas is mainly responsible for causing acid rains. Rapid exploitation of sulphur deposits is another feature, which causes anxiety to us. These deposits are believed to have been produced by the activity of anaerobic bacteria (*Baggiota* sp) from hydrogen sulphide gas. We are consuming these deposits faster than they are formed naturally. A day might come when there will be no good deposits of sulphur left for human use.

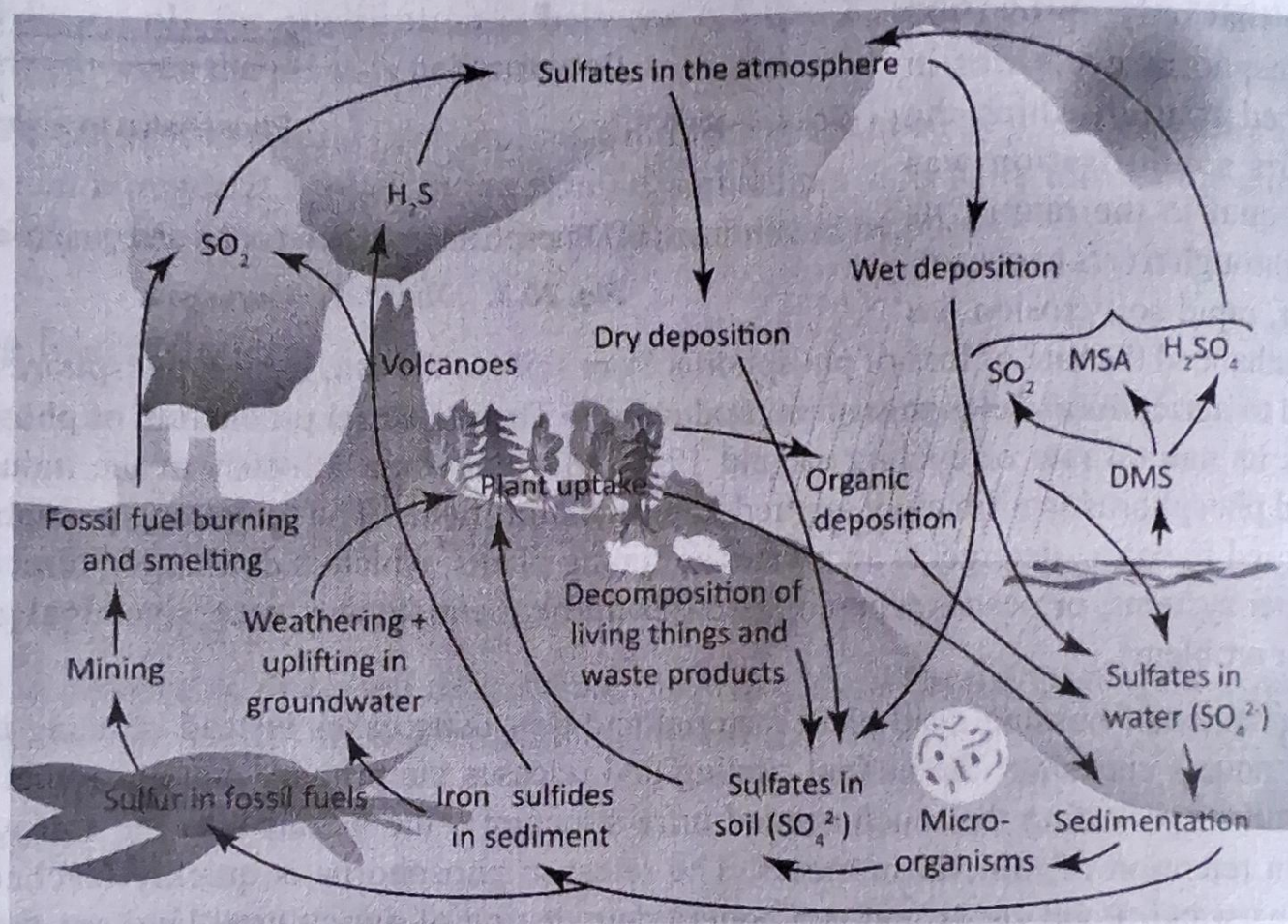


Fig. 20.4. Sulphur cycle.