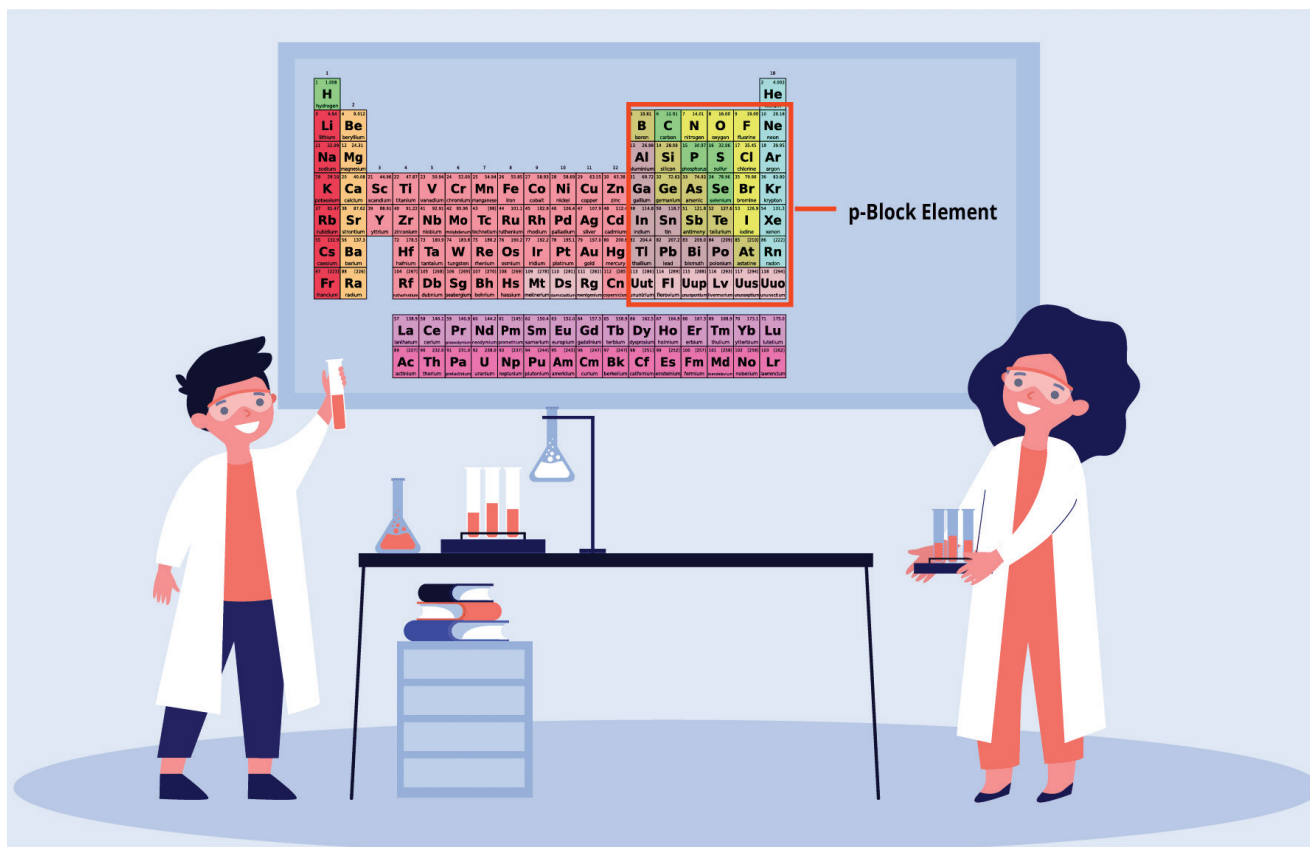


THE p-BLOCK ELEMENTS - 2



For Quick Revision and Smart Practice

NEET FAST FORWARD

An Innovation of NEET Experts with 30+ years of Blissful Teaching
Experience and Inspiration of Lakh+ successful MEDICO professionals



India's First e - Magazine with Live Testing

THE p-BLOCK ELEMENTS

Sulphur and its Compounds

Allotropic Forms of Sulphur

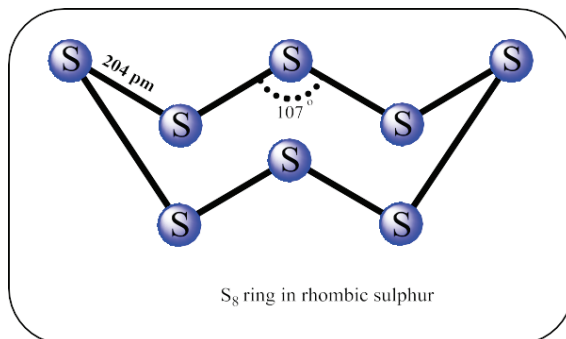
Sulphur forms a variety of allotropes. The most common allotropes are yellow rhombic and monoclinic sulphur. Rhombic sulphur is more stable at room temperature. It gets transformed to monoclinic sulphur when heated above 369 K.

Rhombic Sulphur

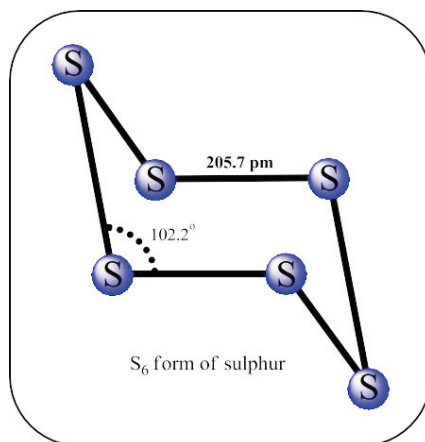
- This allotrope is yellow in colour. Its melting point is about 385.8 K and specific gravity is 2.06.
- Rhombic sulphur crystals are formed when the solution of roll sulphur in CS_2 is evaporated.
- It is insoluble in water but dissolves to some extent in benzene, alcohol and ether. It is more soluble in CS_2 .

Monoclinic Sulphur

- Its melting point is 393 K and its specific gravity is 1.98. It is soluble in CS_2 .
- This form of sulphur is prepared by melting rhombic sulphur in a dish and cooling, till a crust is formed.
- Two holes are made in the crust and the remaining liquid is poured out. After removing the crust, colourless needle-shaped crystals of sulphur are formed.
- It is stable above 369 K and transforms into sulphur below 369 K.
- Also, we can say that the sulphur is stable below 369 K and transforms into sulphur above this. At 369 K, both forms are stable. This temperature is called transition temperature.
- Rhombic and monoclinic sulphur have S_8 molecules. These S_8 molecules are packed to give different crystal structures. The S_8 ring in both forms is puckered and has a crown shape.



- In the cyclo- S_6 form, the molecule is in the chair shape.

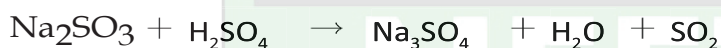


- At very high temperatures (~1000 K); S₂ is paramagnetic like O₂.

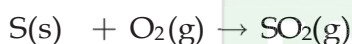
Sulphur Dioxide

Preparation

- It can be prepared in the laboratory with the action of metallic sulphate on a dilute acid. **For Quick Revision and Smart Practice**



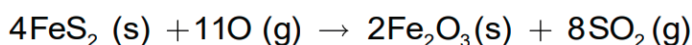
- Sulphur dioxide is formed together with a trace amount of sulphur trioxide (6-8%) when sulphur is burnt in air or oxygen:



- In the laboratory, sulphite is treated with dilute sulphuric acid to give sulphur dioxide.



- It is also produced as a by-product of the roasting of sulphide ores.



- The gas is first dried and is liquefied under pressure and stored in steel cylinders.

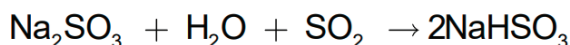
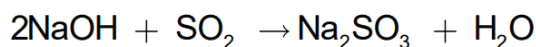
Properties

Physical Properties

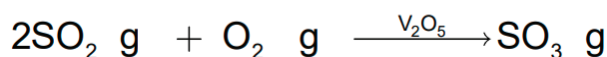
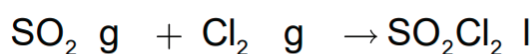
- Sulphur dioxide is one of the gases which can be easily liquefied.
- Sulphur dioxide is a colourless gas with pungent smell and is highly soluble in water.
- It liquefies at room temperature under a pressure of 2 atmospheres and boils at 263 K.
- When sulphur dioxide is passed through water, it forms a solution of sulphurous acid.

Chemical Properties

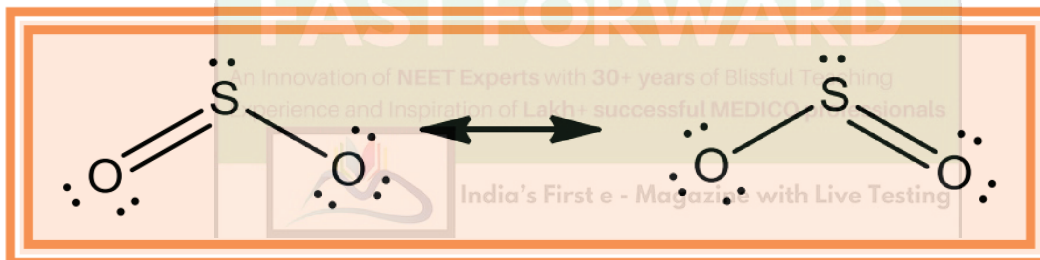
- It reacts with sodium hydroxide solution to give sodium sulphite, which then reacts with excess of sulphur dioxide to form sodium hydrogen sulphite.



- When sulphur dioxide reacts with water or alkali, its behaviour is similar to that of carbon dioxide.
- Sulphur dioxide reacts with chlorine in the presence of charcoal (which acts as a catalyst) to give sulphuryl chloride SO_2Cl_2 .
- It is oxidised to sulphur trioxide by oxygen in the presence of vanadium (V) oxide catalyst.



- Under moist conditions, sulphur dioxide behaves as a reducing agent. For example, it converts iron (III) ions to iron (II) ions and decolourises acidified potassium permanganate (VII) solution.
- The molecule of SO_2 is angular. It is a resonance hybrid of the two canonical forms:



Uses

- As a bleaching agent
- In refining petroleum and sugar
- In bleaching wool and silk
- As an anti-chlor, disinfectant and preservative
- In the manufacture of sulphuric acid, sodium hydrogen sulphite and calcium hydrogen sulphite (industrial chemicals)
- Liquid SO_2 is used as a solvent to dissolve several organic and inorganic chemical

Oxoacids of Sulphur

- Sulphur dioxide is a strong oxidising agent.
- Sulphur forms several oxoacids such as H_2SO_3 , $\text{H}_2\text{S}_2\text{O}_3$, $\text{H}_2\text{S}_2\text{O}_4$, $\text{H}_2\text{S}_2\text{O}_5$, $\text{H}_2\text{S}_x\text{O}_6$ ($x = 2-5$), H_2SO_4 , $\text{H}_2\text{S}_2\text{O}_7$, H_2SO_5 and $\text{H}_2\text{S}_2\text{O}_8$.



TO DOWNLOAD FULL FILE



[Download Android App](#)

Fast Forward a work of Adhipati Creations that provides the best app for NEET, JEE, BITSAT, CUET and CBSE exam preparation.