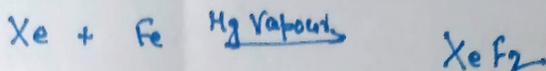


# Compounds of Xenon

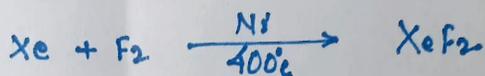
## Xenon Difluoride [XeF<sub>2</sub>]

Preparation of Xenon Difluoride: -

1) XeF<sub>2</sub> is formed by photochemical combination of Xenon and fluorine under the influence of Mercury Vapour.



2) The method consists in heating a mixture of Xenon and fluorine in molecular ratio of 1:3 in a short nickel tube. On cooling quickly, a colourless solid, i.e. XeF<sub>2</sub> is formed.



(Note: In this method excess of xenon has taken to avoid the formation of XeF<sub>4</sub>.)

3) 1:3 mixture of Xenon and fluorine may be subjected to electric discharge to get Xenon difluoride.

Properties: -

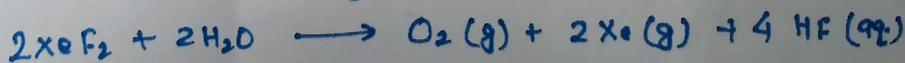
1. Xenon difluoride is a colourless, crystalline solid which melts at 140°C.

2. It dissolves in hydrogen fluoride without reacting with it.

3. It reacts with hydrogen to give hydrogen fluoride and xenon.



4. It reacts with water evolving oxygen.



5. It oxidises iodine in presence of BF<sub>3</sub> to give IF.



6. It is a mild fluorinating agent. Thus it reacts with benzene to give fluorobenzene, C<sub>6</sub>H<sub>5</sub>F.

7. It is also a strong oxidising agent.

It oxidises HCl to Cl<sub>2</sub> and Ce<sup>III</sup> to Ce<sup>IV</sup>.

# Structure and Shape of XeF<sub>2</sub> molecule:

According to the present view, XeF<sub>2</sub> is formed by covalent bonds,



and Xenon atom has 10 electrons in Valency. This is explained on the basis of the orbital as given below:-

One of 5p electrons in Xenon gets unpaired shift to 5d orbital.

The unpaired electrons in 5p and 5d-orbital are used in chemical bonding.

The pairing electrons are provided by the fluorine atoms as shown in figure.

This is evidently a case of sp<sup>3</sup>d hybridisation which gives the molecule a trigonal bipyramidal geometry.

The Xenon and two fluorine atoms lie in a straight line (i.e. linear) while the three equatorial positions are occupied by three lone pairs of electrons. As shown in figure.

