

Compounds of Xenon

By G.Sashank



Objectives

- Xenon oxides.
- Xenon fluorides.
- Xenon oxyfluorides.
- Xenon dioxydifluoride.

Xenon fluorides

a. Xenon difluoride:

Xenon difluoride (XeF_2) is formed when a mixture of Xenon and fluorine in the ratio 1:2 by volume is passed through a nickel tube at 673 K,



b. Xenon tetrafluoride:

Xenon tetrafluoride (XeF_4) is prepared by heating a mixture of xenon and fluorine in the ratio 1:5 in a nickel vessel at 673 K and then suddenly cooling it in acetone. XeF_4 is also formed when an electric discharge is passed through a mixture of xenon and excess of fluorine,



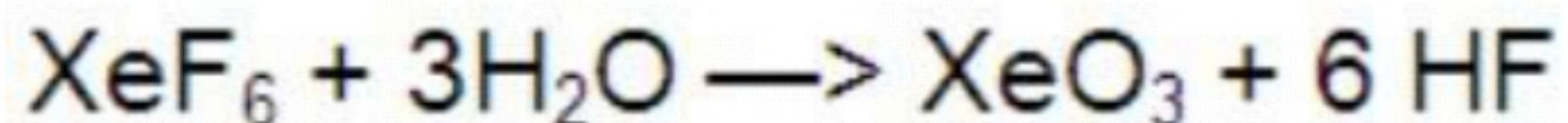
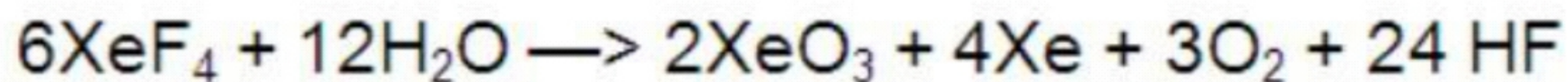
c. Xenon hexafluoride:

Xenon hexafluoride (XeF_6) is prepared by heating a mixture of xenon and fluorine in the ratio 1:20 at $473 - 523\text{K}$ under a pressure of 50 atmospheres.



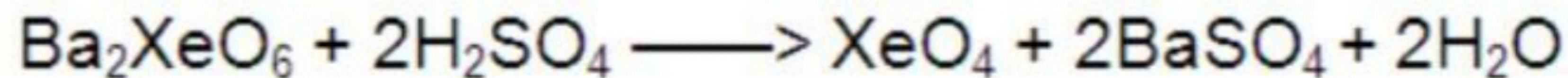
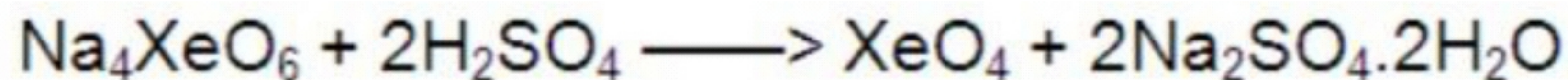
d. Xenon trioxide:

Xenon trioxide (XeO_3) is prepared by complete hydrolysis of XeF_4 or XeF_6



e. Xenon tetraoxide:

Xenon tetraoxide (XeO_4) is prepared by the action of conc. H_2SO_4 on sodium or barium xenate (Na_4XeO_6 , Ba_2XeO_6) at room temperature,



XeO_4 is purified by vacuum sublimation at 195 K.

f. Xenon oxydifluoride:

Xenon oxydifluoride (XeOF_2) is formed by partial hydrolysis of XeF_4 at 193 K,



g. Xenon oxytetrafluoride:

Xenon oxytetrafluoride (XeOF_4) is prepared by partial hydrolysis of XeF_6 ;



It can also be prepared by the reaction of SiO_2 with XeF_6 ,



h. Xenon dioxydifluoride:

Xenon dioxydifluoride (XeO_2F_2) is formed by partial hydrolysis of XeOF_4 or XeF_6



It can also be prepared by mixing XeO_3 and XeOF_4 at low temperature (195K). The product is purified by fractional distillation,



Compound	Formula	Oxidation state of Xe	State of hybridisation	Structure
Xenon difluoride	XeF_2	+ 2	Sp^3d	Linear
Xenon tetrafluoride	XeF_4	+ 4	Sp^3d^2	Square planar
Xenon hexafluoride	XeF_6	+ 6	Sp^3d^3	Distorted octahedral
Xenon trioxide	XeO_3	+ 6	Sp^3	Trigonal pyramidal
Xenon tetraoxide	XeO_4	+ 8	Sp^3	Tetrahedral
Xenon oxydifluoride	XeOF_2	+ 4	Sp^3d	T – shaped
Xenon oxytetrafluoride	XeOF_4	+ 6	Sp^3d^2	Square pyramidal
Xenon dioxydifluoride	XeO_2F_2	+ 6	Sp^3d	Distorted bipyramidal

Thank you...