

xenon fluoride compound has xenon 53.5 %.what is the oxidation state of xenon?

Solution:

If we permit we have 100 g of xenon fluoride, we will have 53.5 g of xenon and 46.5 g (100-53.5) of fluorine. The equivalent of fluorine is:

$$E(\text{F}) = \frac{\text{Ar}(\text{F})}{\text{valency}} = \frac{19.0}{1} = 19.0 \text{ g/mol}.$$

We use the equivalent's law, to determine the equivalent of xenon:

$$\frac{m(\text{Xe})}{m(\text{F})} = \frac{E(\text{Xe})}{E(\text{F})}, \text{ hence } E(\text{Xe}) = \frac{m(\text{Xe}) \cdot E(\text{F})}{m(\text{F})} = \frac{53.5 \cdot 19.0}{46.5} = 21.9 \text{ g/mol}$$

The atom mass of xenon is 131.3 g/mol, so the valency of xenon in this compound is

$$E(\text{Xe}) = \frac{131.3}{21.9} = 6.$$

The compound is XeF_6 .

Answer: in compound XeF_6 the oxidation state (valency) of xenon is **6**.