Question #78326, Chemistry / General Chemis try

In the reaction between red phosphorus (P4) and fluorine, phosphorus trifluoride is produced. If the percent yield is 82.6%, what mass of fluorine is needed to produce 152 g of phosphorus trifluoride?

Solution

$$\underset{}{P_4} + \underset{\text{Xg}}{6F_2} = \underset{\text{152g}}{4PF_3}$$

$$\underset{}{} + \underset{v=6moles}{} = \underset{v=4moles}{}$$

$$M1 = 19 * 2 = 38(g/mole) \qquad M2 = 31 + 3 * 19 = 88(g/mole\ )$$

$$m1 = 6 * 38 = 228\ (g) \qquad m2 = 4 * 88 = 352\ (g)$$

$$\frac{Xg}{228g} = \frac{152g}{352g};$$

$$x = \frac{228 * 152}{352} = 98.45g\ (100\%yield);$$

$$m = 98.45 * \frac{100}{82.6} = \mathbf{119.2}(\boldsymbol{g});$$

Answer provided by AssignmentExpert.com