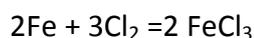A 3.56 g sample of iron powder was heated in gaseous chlorine,and 10.39 g of an iron chloride was formed. what is the percent composition of the compound? show the reaction equation.

Solution:

$$2Fe + 3Cl_2 = 2 FeCl_3$$

According to the reaction equation is a lot of chlorine:

$$\frac{m\ (Cl2)}{3 * M\ (Cl2)} = \frac{m(Fe)}{2 * M(Fe)}$$

$$m\ (Cl2) = \frac{3 * M\ (Cl2) * m(Fe)}{2 * M(Fe)}$$

$$m\ (Cl2) = \frac{3 * 71 * 3,56}{2 * 55,8} = 6.79\ g$$

Find the amount of the substance chlorine and iron, have reacted:

$$n(Cl2) = \frac{m\ (Cl2)}{M\ (Cl2)} = \frac{6,79}{71} = 0,1\ mol$$

$$n(Fe) = \frac{m\ (Fe)}{M\ (Fe)} = \frac{3,56}{55,8} = 0,06\ mol$$

Based on the number of iron-reacted, we received a lot of practice of iron chloride:

$$n(Fe) = n(FeCl3)$$

$$m(FeCl3) = n(FeCl3) * M(FeCl3)$$

$$m(FeCl3) = 0,06 * 162,5 = 9,75\ g$$

$$w(FeCl3) = \frac{m(FeCl3)}{m'(FeCl3)}$$

$$w(FeCl3) = \frac{9,75}{10,39} = 0,94 = 94\%$$

Answer: w (FeCl3) = 0,94= 94%