Answer on Question #56143 - Chemistry - General chemistry
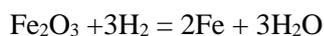
Question:

Consider the reaction for the production of iron?

$Fe_2O3 +3H_2 = 2FE + 3H_2O$ What is the maximum mass of iron that can be obtained by the reaction of 65.25 g of Fe_2O_3 and 25.96 g of H_2?

Solution:

$Fe_2O_3 +3H_2 = 2Fe + 3H_2O$

Let's first calculate initial amounts of the starting material, in order to see who's taken in the excess.

$n(Fe_2O_3)=m(Fe_2O_3)/M(Fe_2O_3)=65.25/(56×2+16×3)=0.41$ mol

$n(H_2)=m(H_2)/M(H_2)=25.96/2=12.98$ mol

From the calculation we can estimate that H2 is in the excess, so we should calculate the mass of the iron from the given iron oxide amount.

$m(Fe)=2×n(Fe)×m(Fe)=2×0.41×56=45.92$ g

Answer: m(Fe)=45.92 g