Answer on Question #62315 - Chemistry - General Chemistry

Question:

Consider the following reaction:

$Fe2O3 + 3\ CO \rightarrow 2\ Fe + 3\ CO2$

If 5 moles of Fe2O3 react with excess CO, what is the maximum amount of Fe and CO2 that can be formed?

Solution:

1) As we already have the balanced equation, we can see the proportion of reagents and products. 1 mole of Fe_2O_3 gives 2 moles of Fe and 3 moles of CO_2. So 5 moles of Fe_2O_3 will yield 10 moles of Fe and 15 moles of CO_2.
2) Convert moles into mass units:
   1 mole of $Fe = 55.8$ g; 10 moles of $Fe = 55.8\ g*10 = 558$ g
   1 mole of $CO_2 = 12+2*16 = 44$ g; 15 moles of $CO_2 = 44\ g * 15 = 660$ g.

Answer:

The maximum amount of Fe and CO_2 that can be formed if 5 moles of Fe_2O_3 react with excess CO is: 10 moles or 558 g of Fe and 15 moles or 660 g of CO_2.