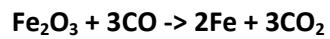


#76500 Chemistry, Other

When 84.8 g of iron (III) oxide reacts with 53.0 g of CO how many grams of Fe are produced?



Answer:

According to this reaction, $n(\text{Fe}) = 2 n(\text{Fe}_2\text{O}_3) = 2/3 n(\text{CO})$

$n = m/M$

$M(\text{Fe}_2\text{O}_3) = 160 \text{ g/mol}$

$M(\text{CO}) = 28 \text{ g/mol}$

$M(\text{Fe}) = 55.9 \text{ g/mol}$

$n(\text{Fe}_2\text{O}_3) = 84.8/160 = 0.53 \text{ mol}$

$n(\text{CO}) = 53.0 / 28 = 1.9 \text{ mol}$

Fe_2O_3 is a limiting reagent here. Therefore:

$n(\text{Fe}) = 2 n(\text{Fe}_2\text{O}_3) = 2 \cdot 0.53 = 1.06 \text{ mol}$

$m(\text{Fe}) = 1.06 \cdot 55.9 = 59.3 \text{ g}$