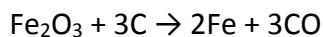


Answer on Question #52445 - Chemistry – Inorganic Chemistry

Question

Iron metal is produced in a blast furnace by the reaction of iron (III) oxide and coke (pure carbon). If 25.0 moles of pure Fe_2O_3 is used, how many grams of iron can be produced? The balanced chemical equation for the reaction is:



Answer:

According to the reaction equation:

1 mol of Fe_2O_3 produces 2 mol of Fe

25.0 mol of Fe_2O_3 – x mol of Fe

$$x = \frac{25.0 \cdot 2}{1} = 50.0 \text{ mol}$$

The mass of iron that can be produced is:

$$m(\text{Fe}) = n(\text{Fe}) \cdot M(\text{Fe}) = 50.0 \cdot 55.8 = 2790 \text{ g}$$

Answer: $m(\text{Fe}) = 2790 \text{ g}$