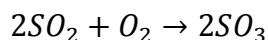


Answer on Question #69055 - Chemistry - General Chemistry

Question: A vessel contains oxygen and sulphur dioxide which react to form sulphur trioxide. If 96.0g of sulphur dioxide reacts with 32.0g of oxygen, what is the mass of the product if formed?

Solution

Sulphur dioxide reacts with oxygen to form sulphur trioxide according to the equation:



From the given masses of the reagents and their molar masses we can find the amounts of substance of each of them:

$$n(SO_2) = \frac{m(SO_2)}{M(SO_2)} = \frac{96}{64} = 1.5 \text{ mol}; \quad n(O_2) = \frac{m(O_2)}{M(O_2)} = \frac{32}{32} = 1 \text{ mol}.$$

From the reaction equation we see that 1 mole of oxygen gas can react with 2 moles of sulphur dioxide gas. So, in our case SO_2 is the limiting reagent. The mass of SO_3 formed in the reaction is

$$m(SO_3) = \frac{m(SO_2) * 2M(SO_3)}{2M(SO_2)} = \frac{96 * 2 * 80}{2 * 64} = 120 \text{ g}.$$

Answer: the mass of SO_3 formed is 120 grams.