Answer on Question #76032, Chemistry / General Chemistry

Question:

What is the theoretical yield of aluminum oxide if 2.20 mol of aluminum metal is exposed to 1.95 mol of oxygen?

Solution:

The balanced equation:

$$4\ Al + 3\ O_2 \rightarrow 2\ Al_2O_3$$

Ratio of reagents: 4 : 3, so aluminum is limiting reactant (and oxygen is in excess).

According to the reaction, the theoretical yield of aluminum oxide: $2.20 / 2 = 1.10$ mol

Mass of aluminum oxide: $1.10 \cdot 101.96 = 112.16$ g

Answer:

1.10 mol

112.16 g