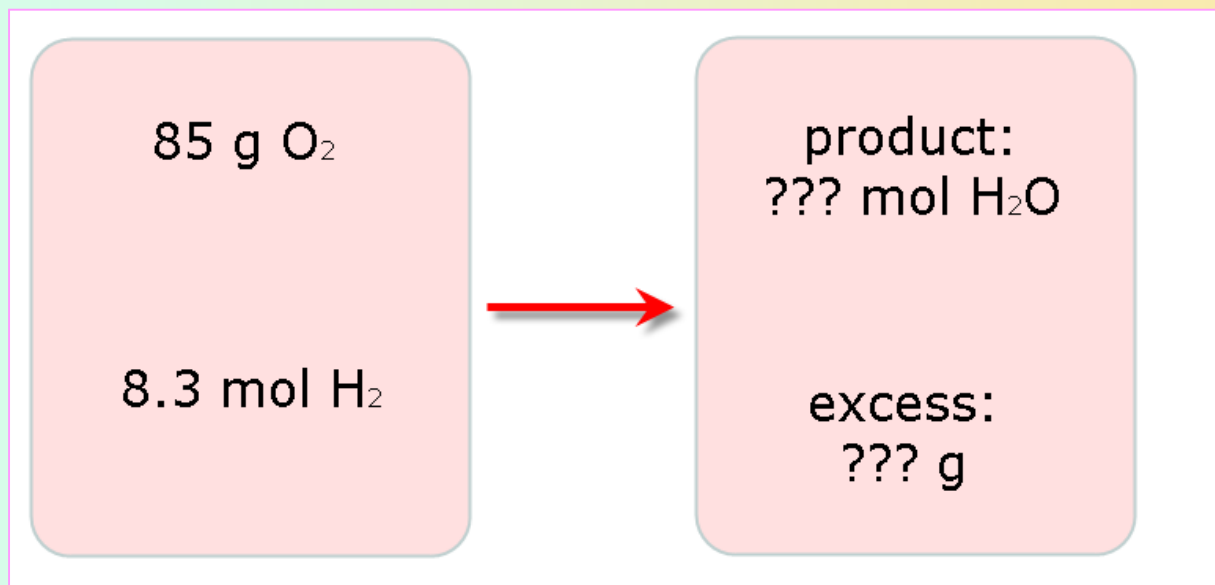


Limiting reactants: exercise

A tank contains 85 grams of oxygen and 8.3 moles of hydrogen. Suppose that both reactants combine together to give water as a product (synthesis of water).

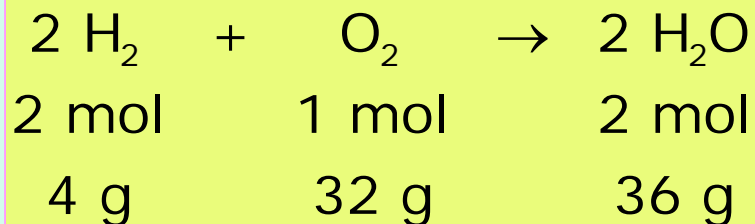
Calculate the amount of water formed (in moles) and the excess of the reactant (in grams) when the reaction is complete.

Atomic weights: O=16; H=1



Limiting reactants: exercise

The balanced equation:

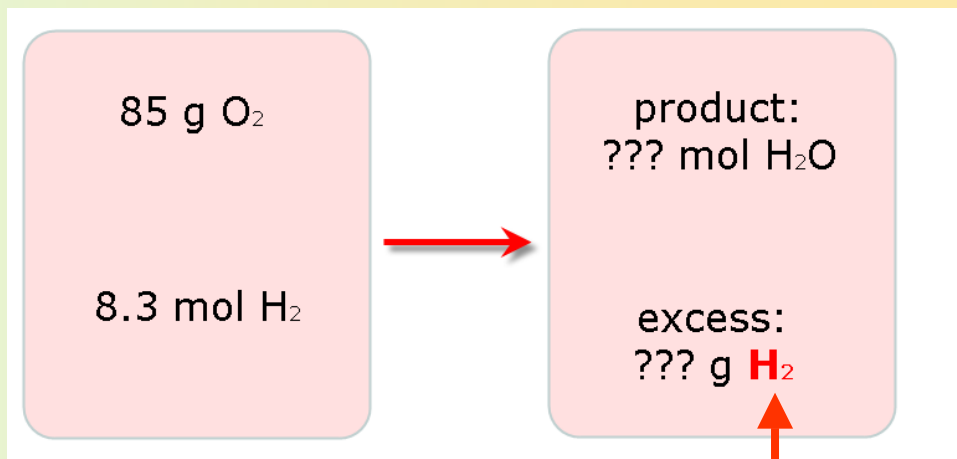


Determination of the limiting reactant and the reactant in excess

To determine which is the limiting reactant, we need to compare the amounts of reactants we have with the values we get from the equation's table

$$x (\text{H}_2) = \frac{8.3 \text{ mol H}_2}{2 \text{ mol H}_2} = 4.15 \text{ times the value of the table}$$

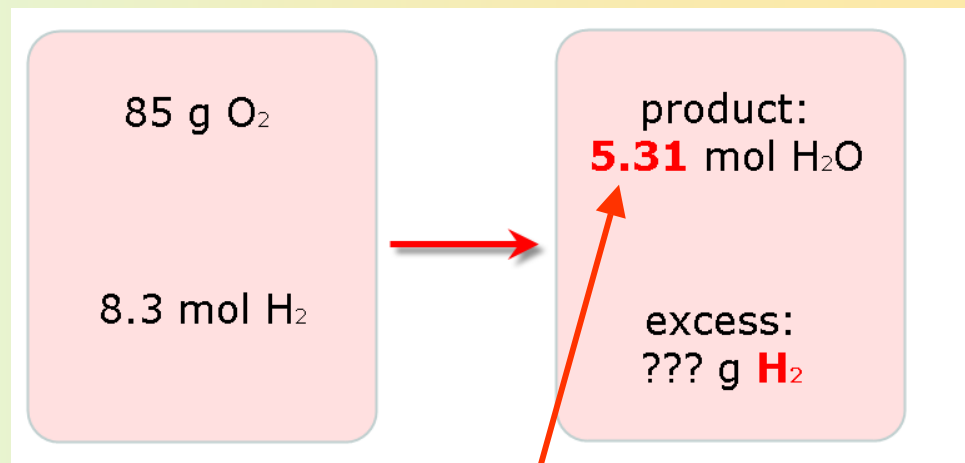
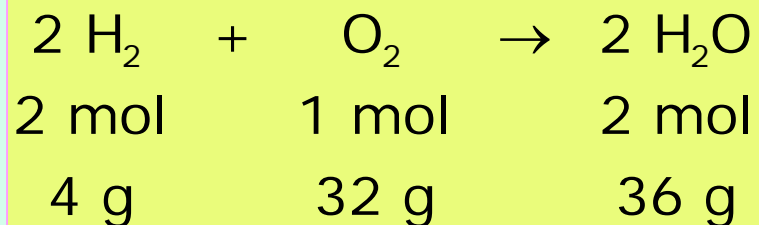
$$x (\text{O}_2) = \frac{85 \text{ g O}_2}{32 \text{ g O}_2} = 2.66 \text{ times the value of the table}$$



**REACTANT
IN EXCESS:
H₂**

**LIMITING
REACTANT:
O₂**

Limiting reactants: exercise

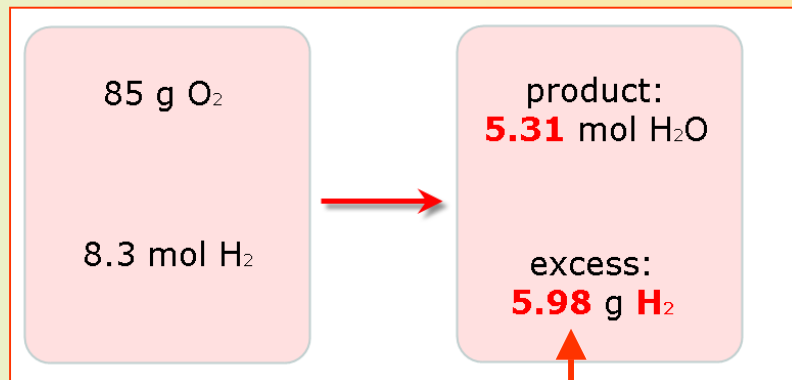
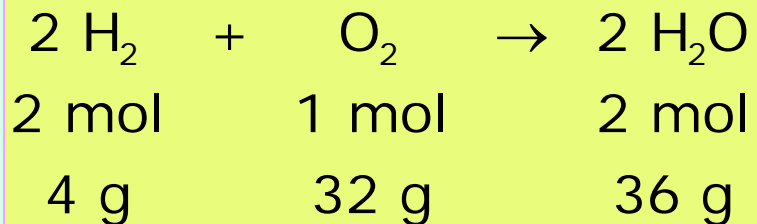


Determination of the product formed

The amount of product formed has to be calculated with the value of the **limiting reactant**.

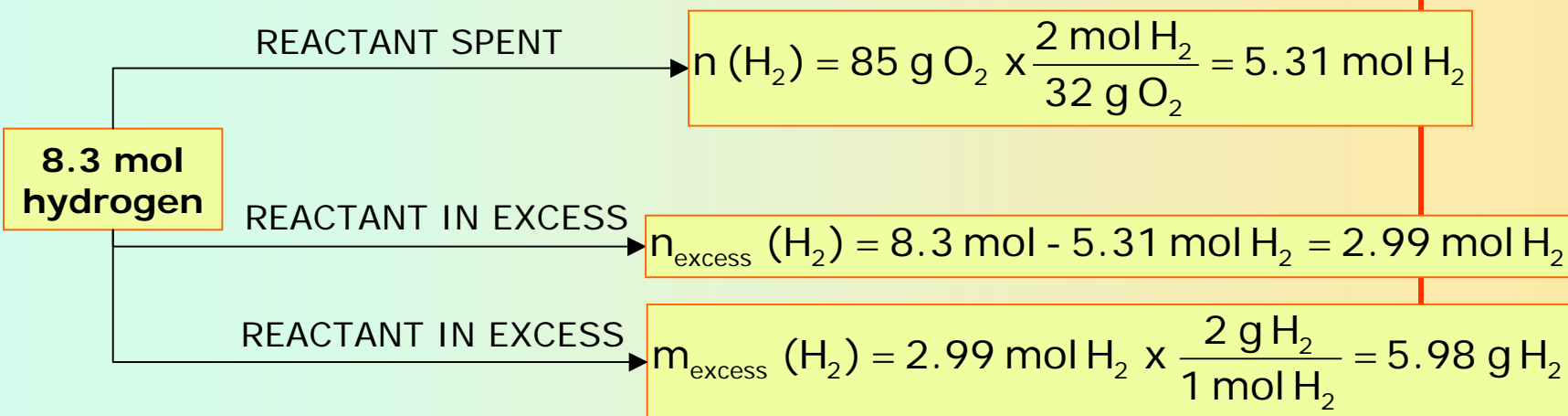
$$n(\text{H}_2\text{O}) = 85 \text{ g O}_2 \times \frac{2 \text{ mol H}_2\text{O}}{32 \text{ g O}_2} = 5.31 \text{ mol H}_2\text{O}$$

Limiting reactants: exercise



Determination of the excess of reactant

First, we have to calculate the amount of the reactant transformed into product, and later calculate the excess by subtraction.



Limiting reactants: exercise

A tank contains 85 grams of oxygen and 8.3 moles of hydrogen. Suppose that both reactants combine together to give water as a product (synthesis of water).

Calculate the amount of water formed (in moles) and the excess of the reactant (in grams) when the reaction is complete.

Atomic weights: O=16; H=1

Solution:

