Question #80729, Chemistry / General Chemistry

If you burn 37.1 g of hydrogen and produce 331 g of water, how much oxygen reacted?

Solution:

Find the moles of H2

$$n(H_2) = \frac{m(H_2)}{M(H_2)} = \frac{37.1g}{2.016g/mol} = 18.4 \; mol$$

Find the moles of Water

$$n(H_2O) = \frac{m(H_2O)}{M(H_2O)} = \frac{331g}{18.02g/mol} = 18.4 \; mol$$

Since the balanced equation is

2 H2   +   O2   -->   2 H2O

1 mole of O2 is required to produce two moles of water

Therefore moles of O2 will be half the moles of water

$$n(O_2) = \frac{1}{2}n(H_2O) = \frac{18.4 \; mol}{2} = 9.2 \; mol$$

Mass of the O2

$$m(O_2) = n(O_2) * M(O_2) = 9.2 \; mol * 32g/mol = 294.4 \; g$$

Answer: 294.4 g

Source: https://courses.lumenlearning.com/boundless-chemistry/chapter/molar-mass/