**Practice Problems**

Here's the equation to use for all three problems:

2 H2 + O2 ---> 2 H2O

1) How many grams of H2O are produced when 2.50 moles of oxygen are used?

2) If 3.00 moles of H2O are produced, how many grams of oxygen must be consumed?

3) How many grams of hydrogen gas must be used, given the data in problem two?

**Answers**

1) How many grams of H2O are produced when 2.50 moles of oxygen are used?

Here are the two substances in the molar ratio I used: http://chemteam.info/Stoichiometry/Molar-Ratio-O2-H2O.GIF

The molar ratio from the problem data is: http://chemteam.info/Stoichiometry/Molar-Ratio-2.50-x.GIF

The proportion to use is: http://chemteam.info/Stoichiometry/Molar-Prop-Ans1-Mass-Mole.GIF

5.00 mol of water is produced, but since the problem asks for grams, we multiply by 18.0 g/mol (the molar mass of water) to get the final answer of 90.0 g.

2) If 3.00 moles of H2O are produced, how many grams of oxygen must be consumed?

Here are the two substances in the molar ratio I used: http://chemteam.info/Stoichiometry/Molar-Ratio-O2-H2O.GIF

The molar ratio from the problem data is: http://chemteam.info/Stoichiometry/Molar-Ratio-3.00-x.GIF

The proportion to use is: http://chemteam.info/Stoichiometry/Molar-Prop-Ans2-Mass-Mole.GIF

We know that 1.50 mol of O2 was consumed, so multiplying that by 32.0 g/mol gives 48.0 g.

3) How many grams of hydrogen gas must be used, given the data in problem two?

Here are the two substances in the molar ratio I used: http://chemteam.info/Stoichiometry/Molar-Ratio-H2-O2.GIF

The molar ratio from the problem data is: http://chemteam.info/Stoichiometry/Molar-Ratio-1.50-x.GIF

The proportion to use is: http://chemteam.info/Stoichiometry/Molar-Ratio-Ans3-Proportion.GIF

The H2 / H2O ratio of 2/2 could have been used also. In that case, the ratio from the problem would have been 3.00 over x, since you were now using the water data and not the oxygen data. 3.00 mol times 2.02 g/mol (the molar mass of hydrogen) gives 6.06 g.