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WP Practice

Exam 6: Stoichiometry

(Also review pretest packet for Unit 9: Stoichiometry)

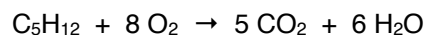
1. 0.126 g of a metal, M, reacts with HCl (aq) to form hydrogen gas and MCl_3 . It is found that 7.00×10^{-3} mole of hydrogen forms. Calculate the atomic mass (g/mol) of the metal and give the chemical symbol. (Tutorial video available)

2. 0.303 g of a metal, M, reacts with H_2SO_4 to form hydrogen gas and M_2SO_4 . It is found that 0.0066 mole hydrogen forms. Calculate the atomic mass of the metal and give the chemical symbol.

3. Hydrogen combines with oxygen to produce water. If the yield for the reaction is 45.0%, how many grams of oxygen will have to be started in the reaction to yield 97.2 grams of water, assuming excess hydrogen? (Hint: use the formula for % yield and solve for theoretical yield) (Tutorial video available)

4. Nitrogen combines with hydrogen to produce NH_3 . If the yield for the reaction is 28.6%, how many grams of hydrogen will have to be started in the reaction to yield 85.5g NH_3 , assuming excess nitrogen? (Hint: use the formula for % yield and solve for theoretical yield)

5. Pentane, C_5H_{12} , burns in oxygen to give carbon dioxide and water according to the following equation:



In one experiment, a mixture of 0.480 mol of pentane was burned in 0.995 mol of oxygen in a sealed steel vessel.

- a) Calculate the theoretical yield, in moles, of water.
- b) Find the limiting reactant, if any.
- c) How many moles of the excess reactant are leftover from the reaction?