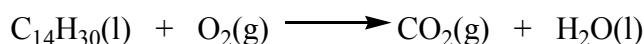
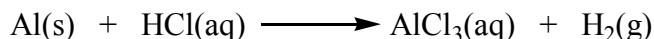


Homework

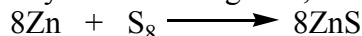
1. The empirical formula of *para*-dichlorobenzene, used as a moth repellent, is $C_6H_4Cl_2$. The molecular mass of compound is 147 u (amu.). What is the molecular formula?
2. Resorcinol, used in manufacturing resins, drugs, and other products, is 65.44% C, 5.49% H, and 29.07% O by mass. Its molecular mass is 110 u (amu.). What is its molecular formula?
3. Kerosene is a mixture of hydrocarbons used in domestic heating and as a jet fuel. Assume that kerosene can be represented as $C_{14}H_{30}$ and that it has a density of 0.763 g/mL. How many grams of CO_2 are produced by the combustion of 1.00 gal (3.785 L) of kerosene?



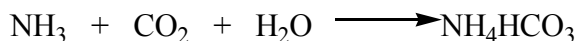
4. How many milliliters of dilute $HCl(aq)$ ($d = 1.045$ g/mL) that is 9.50% HCl by mass are required to react completely with 0.858 g Al ?



5. Calculate the theoretical yield of ZnS , in grams, that can be made from 0.488 g Zn and 0.503 g S_8 . If the actual yield is 0.606 g ZnS , what is the percent yield?



6. A student prepares ammonium bicarbonate by the reaction



She uses 14.8 g NH_3 and 41.3 g CO_2 . Water is present in excess. What is her actual yield of ammonium bicarbonate if she obtains a 74.7% yield in the reaction?

7. Suppose you need about 80 mL of 0.100 M $AgNO_3$. You have available about 150 mL of 0.0400 M $AgNO_3$ and also about 1.0 g of solid $AgNO_3$. Assume that you have available standard laboratory equipment such as an analytical balance, 10.00-mL and 25.00-mL pipets, 100.0-mL and 250.0-mL volumetric flasks, and so on. Describe how you would prepare the desired $AgNO_3$ solution, including actual masses or volumes required.
 8. How many grams of $BaSO_4(s)$ are formed when an excess of $BaCl_2(aq)$ is added to 635 mL of 0.314 M $Na_2SO_4(aq)$?
- $$BaCl_2(aq) + Na_2SO_4(aq) \longrightarrow BaSO_4(s) + 2NaCl(aq)$$
9. What volume of 0.0250 M $MgCl_2$ should be diluted to 250.0 mL to obtain a solution with $[Cl^-] = 0.0135$ M?
 10. When aqueous solutions of copper(II) nitrate and potassium carbonate are mixed, a precipitate forms. Write the net ionic equation for this reaction.