**Stoichiometry Involving Solutions Worksheet**

|  |  |
| --- | --- |
| **1.** | **Calculate the number of mL of 2.00 M HNO3 solution required to react with 216 grams of Ag according to the equation.** |
|  | **3 Ag(s) + 4 HNO3(aq) ---------> 3 AgNO3(aq) + NO(g) + 2 H2O(l)** |
| **2.** | **Calculate in mL the volume of 0.500 M NaOH required to react with 3.0 grams of acetic acid. The equation is:** |
|  | **NaOH(aq) + HC2H3O2(aq) -------> NaC2H3O2(aq) + H2O(l)** |
| **3.** | **Calculate the number of grams of AgCl formed when 0.200 L of 0.200 M AgNO3 reacts with an excess of CaCl2. The equation is:** |
|  | **2 AgNO3(aq) + CaCl2(aq) -------> 2 AgCl(s) + Ca(NO3)2(aq)** |
| **4.** | **Calculate  the mass of AgCl formed when an excess of 0.100 M solution of NaCl is added to 0.100 L of 0.200 M AgNO3.** |
| **5.** | **Calculate:** |
|  | **a) the mass of BaSO4 formed when excess 0.200 M Na2SO4 solution is added to 0.500 L of 0.500 M BaCl2 solution, and** |
|  | **b) the minimum volume of the Na2SO4 solution needed to precipitate the Ba2+ ions from the BaCl2 solution.** |
| **6.** | **A sample of impure sodium chloride weighing 1.00 grams is dissolved in water and completely reacted with silver nitrate solution. The dried precipitate of AgCl has a mass of 1.48 grams . Calculate the percentage of NaCl in the original impure sample.** |
| **7.** | **To neutralize the acid in 10.0 mL of 18.0 M H2SO4 that was accidentally spilled on a laboratory bench top, solid sodium bicarbonate was used. The container of sodium bicarbonate was known to weigh 155.0 g before this use and out of curiosity its mass was measured as 144.5 g afterwards. The reaction that neutralizes sulphuric acid this way is as follows.** |
|  | **H2SO4 + 2 NaHCO3 --------> Na2SO4 + 2 CO2 + 2 H2O** |
|  | **Was sufficient sodium bicarbonate used? Calculate the limiting reactant and the maximum yield in grams of sodium sulphate.** |
| **8.** | **Barium nitrate and potassium sulphate solutions react and form a precipitate. What is the precipitate?   How many mL of 0.40 M Ba(NO3)2 solution are required to precipitate completely the sulphate ions in 25 mL of 0.80 M K2SO4 solution?** |
| **9.** | **What mass of silver chloride can be precipitated from a silver nitrate solution by 200 mL of a solution of 0.50 M CaCl2?** |