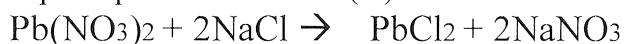


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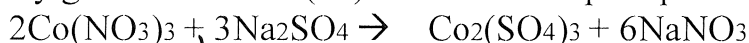
Worksheet: Solution Stoichiometry

1. How many grams of lead (II) nitrate are needed to fully react 23.5 mL of 0.55 M sodium chloride in the precipitation of lead (II) chloride?



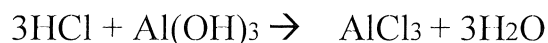
$$\frac{.0235\text{L}}{1\text{ Liter}} \times \frac{.55\text{mol}}{2\text{mol NaCl}} \times \frac{1\text{mol Pb}(\text{NO}_3)_2}{1\text{mol Pb}(\text{NO}_3)_2} \times \frac{331.2\text{g}}{1\text{mol Pb}(\text{NO}_3)_2} = \boxed{2.1\text{g Pb}(\text{NO}_3)_2}$$

2. When 53 mL of 0.75 M cobalt (III) nitrate are added to a sodium sulfate solution, how many grams of cobalt (III) sulfate can be precipitated?



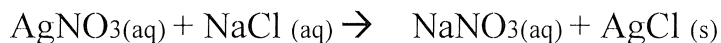
$$\frac{.053\text{L}}{1\text{ Liter}} \times \frac{.75\text{mol}}{2\text{mol Co}(\text{NO}_3)_3} \times \frac{1\text{mol Co}_2(\text{SO}_4)_3}{1\text{mol Co}_2(\text{SO}_4)_3} \times \frac{406.1\text{g Co}_2(\text{SO}_4)_3}{1\text{mol Co}_2(\text{SO}_4)_3} = \boxed{8.1\text{g Co}_2(\text{SO}_4)_3}$$

3. How many grams of aluminum hydroxide will be neutralized by 45.3 mL of 0.55 M HCl ?



$$\frac{.0453\text{L}}{1\text{ Liter}} \times \frac{0.55\text{mol}}{3\text{mol HCl}} \times \frac{1\text{mol Al}(\text{OH})_3}{1\text{mol Al}(\text{OH})_3} \times \frac{78\text{g Al}(\text{OH})_3}{1\text{mol Al}(\text{OH})_3} = \boxed{0.648\text{g Al}(\text{OH})_3}$$

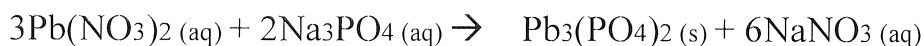
4. What mass of AgCl will precipitate when .050 L of a 0.0500 M solution of AgNO₃ reacts with 25.0 mL of 0.0330 M NaCl ?



$$\frac{.050\text{L}}{1\text{ Liter}} \times \frac{0.05\text{mol}}{1\text{mol AgNO}_3} \times \frac{1\text{mol AgCl}}{1\text{mol AgCl}} \times \frac{143.4\text{g AgCl}}{1\text{mol AgCl}} = .36\text{g AgCl}$$

$$\frac{.025\text{L}}{1\text{ Liter}} \times \frac{0.033\text{mol}}{1\text{mol NaCl}} \times \frac{1\text{mol AgCl}}{1\text{mol AgCl}} \times \frac{143.4\text{g AgCl}}{1\text{mol AgCl}} = \boxed{.12\text{g AgCl}}$$

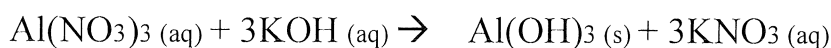
5. 50.0 mL of 0.100 M Na_3PO_4 is mixed with 150.0 mL of 0.250 M $\text{Pb}(\text{NO}_3)_2$ to produce a solid precipitate of lead (II) phosphate. What mass of this precipitate will be produced?



$$\frac{.050\text{L} \mid .1\text{mol} \mid 1\text{mol} \mid 811.6\text{g}}{1\text{liter} \mid 2\text{mol} \mid 1\text{mol}} = \boxed{2.03\text{g Pb}_3(\text{PO}_4)_2}$$

$$\frac{.150\text{L} \mid .250\text{mol} \mid 1\text{mol} \mid 811.6\text{g}}{1\text{liter} \mid 3\text{mol} \mid 1\text{mol}} = 10.1\text{g}$$

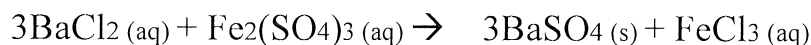
6. What mass of solid aluminum hydroxide is produced when 50.0 mL of 0.200 M $\text{Al}(\text{NO}_3)_3$ is added to 200.0 mL of 0.100 M KOH ?



$$\frac{.050\text{L} \mid .200\text{mol} \mid 1\text{mol} \mid 84\text{g}}{1\text{liter} \mid 1\text{mol} \mid 1\text{mol}} = 0.84\text{g}$$

$$\frac{.200\text{L} \mid .100\text{mol} \mid 1\text{mol} \mid 84\text{g}}{1\text{liter} \mid 3\text{mol} \mid 1\text{mol}} = \boxed{0.56\text{g Al}(\text{OH})_3}$$

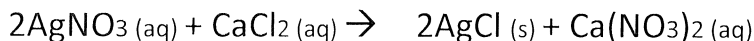
7. What mass of barium sulfate is produced when 100.0 mL of a 0.100 M solution of barium chloride is mixed with 100.0 mL of a 0.100 M solution of iron (III) sulfate?



$$\frac{.100\text{L} \mid .100\text{mol} \mid 3\text{mol} \mid 233.4\text{g}}{1\text{liter} \mid 3\text{mol} \mid 1\text{mol}} = \boxed{2.33\text{g BaSO}_4}$$

$$\frac{.100\text{L} \mid .100\text{mol} \mid 3\text{mol} \mid 233.4\text{g}}{1\text{liter} \mid 1\text{mol} \mid 1\text{mol}} = 6.99\text{g}$$

8. How many grams of silver chloride can be prepared by the reaction of 100.0 mL of 0.20 M silver nitrate with 100.0 mL of 0.15 M calcium chloride?



$$\frac{.100\text{L} \mid .20\text{mol} \mid 2\text{mol} \mid 143.4\text{g}}{1\text{liter} \mid 2\text{mol} \mid 1\text{mol}} = \boxed{2.9\text{g AgCl}}$$

$$\frac{.100\text{L} \mid .15\text{mol} \mid 2\text{mol} \mid 143.4\text{g}}{1\text{liter} \mid 1\text{mol} \mid 1\text{mol}} = 4.3\text{g}$$