

Name \_\_\_\_\_

### Solution Stoichiometry Worksheet

Solve the following solutions Stoichiometry problems:

1. How many grams of silver chromate will precipitate when 150. mL of 0.500 M silver nitrate are added to 100. mL of 0.400 M potassium chromate?



$0.150 \text{ L AgNO}_3$	$0.500 \text{ moles AgNO}_3$	$1 \text{ moles Ag}_2\text{CrO}_4$	$331.74 \text{ g Ag}_2\text{CrO}_4$	$= 12.4 \text{ g Ag}_2\text{CrO}_4$
	$1 \text{ L}$	$2 \text{ moles AgNO}_3$	$1 \text{ moles Ag}_2\text{CrO}_4$	

$0.100 \text{ L K}_2\text{CrO}_4$	$0.400 \text{ moles K}_2\text{CrO}_4$	$1 \text{ moles Ag}_2\text{CrO}_4$	$331.74 \text{ g Ag}_2\text{CrO}_4$	$= 13.3 \text{ g Ag}_2\text{CrO}_4$
	$1 \text{ L}$	$1 \text{ moles K}_2\text{CrO}_4$	$1 \text{ moles Ag}_2\text{CrO}_4$	

2. How many mL of 0.280 M barium nitrate are required to precipitate as barium sulfate all the sulfate ions from 25.0 mL of 0.350 M aluminum sulfate? (**93.8 mL barium nitrate**)



$0.0250 \text{ L Al}_2(\text{SO}_4)_3$	$0.350 \text{ moles Al}_2(\text{SO}_4)_3$	$3 \text{ moles Ba(NO}_3)_2$	$1 \text{ L}$	$= 0.0938 \text{ L Ba(NO}_3)_2$
	$1 \text{ L}$	$1 \text{ moles Al}_2(\text{SO}_4)_3$	$0.280 \text{ moles Ba(NO}_3)_2$	

3. 25.0 mL of 0.350 M NaOH are added to 45.0 mL of 0.125 M copper (II) sulfate. How many grams of copper (II) hydroxide will precipitate?



$0.0250 \text{ L NaOH}$	$0.350 \text{ moles NaOH}$	$1 \text{ moles Cu(OH)}_2$	$97.57 \text{ g Cu(OH)}_2$	$= 0.427 \text{ g Cu(OH)}_2$
	$1 \text{ L NaOH}$	$2 \text{ moles NaOH}$	$1 \text{ mole Cu(OH)}_2$	

$0.0450 \text{ L CuSO}_4$	$0.125 \text{ moles CuSO}_4$	$1 \text{ moles Cu(OH)}_2$	$97.57 \text{ g Cu(OH)}_2$	$= 0.549 \text{ g Cu(OH)}_2$
	$1 \text{ L NaOH}$	$1 \text{ moles CuSO}_4$	$1 \text{ mole Cu(OH)}_2$	

4. What volume of 0.415 M silver nitrate will be required to precipitate as silver bromide all the bromide ion in 35.0 mL of 0.128 M calcium bromide?



$0.0350 \text{ L CaBr}_2$	$0.128 \text{ moles CaBr}_2$	$2 \text{ moles AgNO}_3$	$1 \text{ L AgNO}_3$	$= 0.0216 \text{ L AgNO}_3$
	$1 \text{ L CaBr}_2$	$1 \text{ moles CaBr}_2$	$0.415 \text{ mole AgNO}_3$	

5. What volume of 0.496 M HCl is required to neutralize 20.0 mL of 0.809 M sodium hydroxide?



$0.0200 \text{ L NaOH}$	$0.809 \text{ mole NaOH}$	$1 \text{ mole HCl}$	$1 \text{ L HCl}$	$= 0.0326 \text{ L HCl}$
	$1 \text{ L NaOH}$	$1 \text{ mole NaOH}$	$0.496 \text{ mole HCl}$	

6. How many mL of 0.715 M HCl is required to neutralize 1.25 grams of sodium carbonate? (producing carbonic acid)



1.25 g Na <sub>2</sub> CO <sub>3</sub>	1 mole Na <sub>2</sub> CO <sub>3</sub>	2 mole HCl	1 L HCl	= 0.0330 L HCl
	105.99 g Na <sub>2</sub> CO <sub>3</sub>	1 mole Na <sub>2</sub> CO <sub>3</sub>	0.715 mole HCl	

7. What minimum number of grams of oxalic acid monohydrate, H<sub>2</sub>C<sub>2</sub>O<sub>4</sub>•H<sub>2</sub>O, would you specify for a titration of no fewer than 15.0 mL of 0.100 M NaOH? Both of the hydrogen's from oxalic acid are replaceable in this reaction.



0.0150 L NaOH	0.100 mole NaOH	1 mole H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> •H <sub>2</sub> O	108.06 g H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> •H <sub>2</sub> O	= 0.0810 g H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> •H <sub>2</sub> O
	1 L NaOH	2 mole NaOH	1 mole H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> •H <sub>2</sub> O	

8. How many grams of magnesium hydroxide will precipitate if 25.0 mL of 0.235 M magnesium nitrate are combined with 30.0 mL of 0.260 M potassium hydroxide?



0.0250 L Mg(NO <sub>3</sub> ) <sub>2</sub>	0.235 mole Mg(NO <sub>3</sub> ) <sub>2</sub>	1 mole Mg(OH) <sub>2</sub>	58.33 g Mg(OH) <sub>2</sub>	= 0.343 Mg(OH) <sub>2</sub>
	1 L Mg(NO <sub>3</sub> ) <sub>2</sub>	1 mole Mg(NO <sub>3</sub> ) <sub>2</sub>	1 mole Mg(OH) <sub>2</sub>	

0.0300 L KOH	0.260 mole KOH	1 mole Mg(OH) <sub>2</sub>	58.33 g Mg(OH) <sub>2</sub>	= 0.227 g Mg(OH) <sub>2</sub>
	1 L KOH	2 mole KOH	1 mole Mg(OH) <sub>2</sub>	

9. 60.0 mL of 0.322 M potassium iodide are combined with 20.0 mL of 0.530 M lead (II) nitrate. How many grams of lead (II) iodide will precipitate?



0.0600 L KI	0.322 mole KI	1 mole PbI <sub>2</sub>	461.00 g PbI <sub>2</sub>	= 4.45 g PbI <sub>2</sub>
	1 L KI	2 mole KI	1 mole PbI <sub>2</sub>	

0.0200 L Pb(NO <sub>3</sub> ) <sub>2</sub>	0.530 mole Pb(NO <sub>3</sub> ) <sub>2</sub>	1 mole PbI <sub>2</sub>	461.00 g PbI <sub>2</sub>	= 4.89 g PbI <sub>2</sub>
	1 L Pb(NO <sub>3</sub> ) <sub>2</sub>	1 mole Pb(NO <sub>3</sub> ) <sub>2</sub>	1 mole PbI <sub>2</sub>	