

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 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 L	2 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 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 L	$= 0.0938 \text{ L Ba(NO}_3)_2$
	1 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 L NaOH	0.350 moles NaOH	1 moles Cu(OH)_2	97.57 g Cu(OH)_2	$= 0.427 \text{ g Cu(OH)}_2$
	1 L NaOH	2 moles NaOH	1 mole Cu(OH)_2	

0.0450 L CuSO_4	$0.125 \text{ moles CuSO}_4$	1 moles Cu(OH)_2	97.57 g Cu(OH)_2	$= 0.549 \text{ g Cu(OH)}_2$
	1 L NaOH	1 moles CuSO_4	1 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 L CaBr_2	$0.128 \text{ moles CaBr}_2$	2 moles AgNO_3	1 L AgNO_3	$= 0.0216 \text{ L AgNO}_3$
	1 L CaBr_2	1 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 L NaOH	0.809 mole NaOH	1 mole HCl	1 L HCl	$= 0.0326 \text{ L HCl}$
	1 L NaOH	1 mole NaOH	0.496 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 ₂ CO ₃	1 mole Na ₂ CO ₃	2 mole HCl	1 L HCl	= 0.0330 L HCl
	105.99 g Na ₂ CO ₃	1 mole Na ₂ CO ₃	0.715 mole HCl	

7. What minimum number of grams of oxalic acid monohydrate, H₂C₂O₄•H₂O, 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 ₂ C ₂ O ₄ •H ₂ O	108.06 g H ₂ C ₂ O ₄ •H ₂ O	= 0.0810 g H ₂ C ₂ O ₄ •H ₂ O
	1 L NaOH	2 mole NaOH	1 mole H ₂ C ₂ O ₄ •H ₂ 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 ₃) ₂	0.235 mole Mg(NO ₃) ₂	1 mole Mg(OH) ₂	58.33 g Mg(OH) ₂	= 0.343 Mg(OH) ₂
	1 L Mg(NO ₃) ₂	1 mole Mg(NO ₃) ₂	1 mole Mg(OH) ₂	

0.0300 L KOH	0.260 mole KOH	1 mole Mg(OH) ₂	58.33 g Mg(OH) ₂	= 0.227 g Mg(OH) ₂
	1 L KOH	2 mole KOH	1 mole Mg(OH) ₂	

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 ₂	461.00 g PbI ₂	= 4.45 g PbI ₂
	1 L KI	2 mole KI	1 mole PbI ₂	

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