

## Q4

**Start Date:** 11 Feb 2008 at 06:00 PM

**Due Date:** 11 Feb 2008 at 08:00 PM

**Student Access after Due Date:** Yes. Mark Late

**Graded:** Yes

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## Review Question 4.1

Match each of the following terms dealing with solutions with its single best definition:

solvent

solute

concentration

1. The ratio of amount of solute to either the amount of solvent or amount of solution.
2. Any substance dissolved in the solvent.
3. A homogeneous mixture in which molecules or ions of the components freely intermingle.

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## Review Question 4.2

Match each of the following terms dealing with solutions to its single best definition:

concentrated

dilute

saturated

unsaturated

supersaturated

solubility

1. The amount of solute required to give a saturated solution.
2. A solution that contains more solute than required for saturation.
3. A solution that contains less solute than required for saturation.
4. A solutions that contains the dissolvent limit of solute for the amount a solvent at the given temperature.
5. A solution where the ratio of solute to solvent is small.
6. A solution where the ratio of solute to solvent is large.

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## Review Question 4.3

Why are chemical reactions often carried out using solutions? Select all that apply.

- Even very small amounts of reactants can be combined by using dilute solutions.
  - The molecules or ions in a solution can freely intermingle.
  - The solvent must always be water, so it is impossible for a fire to start.
  - The amount of each reactant can be controlled by adjusting the volume of each solution that is used.
  - The heterogeneous nature of solutions prevents the reactants from freely mixing.
  - A color change will always occur when a reaction is conducted in solution.
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## Review Question 4.4

What will happen if a crystal of sugar is added to the following? Select the single best answer.

a saturated solution of sugar

a supersaturated solution of sugar

an unsaturated solution of sugar

1. The crystal will dissolve.
  2. The crystal will not dissolve and it will cause the extra sugar in solution to crystallize (precipitate).
  3. The crystal will not dissolve.
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## Review Question 4.5

What is the meaning of the term *precipitate* and what conditions are required for a precipitate to form spontaneously in solution? Select all that apply.

- The solution must be aqueous and at room temperature.
  - A precipitate will always form when two different solutions are mixed.
  - A solid that forms in solution.
  - A solid that dissolves in solution.
  - The solubility of a solute in solution must be exceeded.
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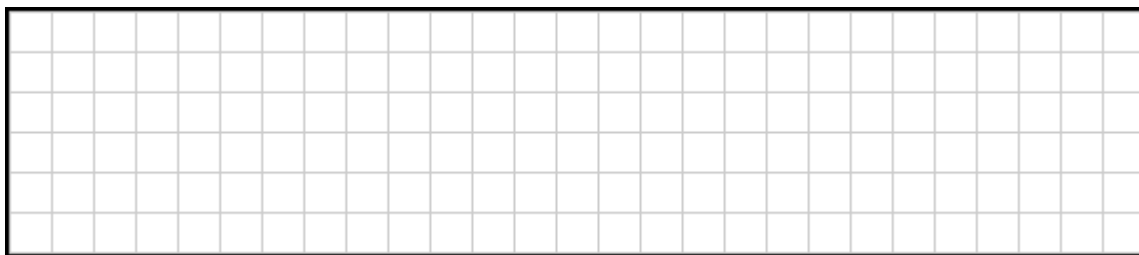
## Review Question 4.6

Select all that apply to an *electrolyte* or *nonelectrolyte*.

- Electrolytes are substances that dissociate or ionize in water to produce cations and anions.
- Nonelectrolytes are substances that dissociate or ionize in water to produce cations and anions.
- Electrolytes are substances that **do not** dissociate or ionize in water to produce cations and anions.
- Nonelectrolytes are substances that **do not** dissociate or ionize in water to produce cations and anions.







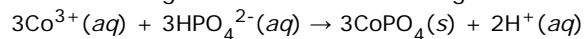
## Review Question 4.12

Answer the following about ionic equations.

Which two conditions must be fulfilled by balanced ionic equations?

- Mass must be balanced.
- The sum of coefficients for reactants and products must be equal.
- Electrical charge must be balanced.
- The number of reactants must equal the number of products.

Select the single best answer concerning the following equation:



- It is **unbalanced** because charge is not balanced.
- It is **unbalanced** because mass is not balanced
- It is **unbalanced** because neither mass nor charge is balanced
- It is a correctly **balanced** equation.

## Review Question 4.13

Select all the answers that apply to acids or bases.

Acids:

- Turns litmus red.
- Turns litmus blue.
- Always contain a metal anion.
- Are involved in neutralization reactions.
- Taste tart or sour.
- Taste bitter and have a soapy "feel".

Bases:

- Taste tart or sour.
- Turns litmus red.

- Taste bitter and have a soapy "feel".
- Turns litmus blue.
- Always contain a metal cation.
- Are involved in neutralization reactions.

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## Review Question 4.14

You suspect a solution is basic. If you are correct, what would happen if you:

Put a drop of the solution on red litmus paper?

Put a drop of the solution on blue litmus paper?

Dropped *both* red and blue litmus paper into the solution?

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## Review Question 4.15

How did Arrhenius define the following?

Acids:

Bases:

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## Review Question 4.16

Do the following undergo *dissociation* or *ionization* in water?

NaOH:  HNO<sub>3</sub>:

NH<sub>3</sub>:  H<sub>2</sub>SO<sub>4</sub>:

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## Review Question 4.17

Do the following yield *acidic* or *basic* solutions in water?

P<sub>4</sub>O<sub>10</sub>:  K<sub>2</sub>O:

SeO<sub>3</sub>:  Cl<sub>2</sub>O<sub>7</sub>:

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## Review Question 4.18

Answer the following by selecting all correct answers.

Dynamic equilibrium:

- Can only occur in water.
- Is used to describe what happens when strong acids or strong bases are added to water.
- Is used to describe what happens when weak acids or weak bases are added to water.
- Is a condition where two opposing processes are occurring at the same rate.

Consider the addition of acetic acid ( $\text{HC}_2\text{H}_3\text{O}_2$ ) to water:

- An equilibrium will form between its molecular form,  $\text{HC}_2\text{H}_3\text{O}_2$ , and the ionized form,  $\text{H}^+$  and  $\text{C}_2\text{H}_3\text{O}_2^-$ .
- Acetic acid is a weak acid and will not ionize completely.
- An equilibrium will form between its molecular form,  $\text{HC}_2\text{H}_3\text{O}_2$ , and the species formed by addition of water,  $\text{H}_3\text{C}_2\text{H}_3\text{O}_3$ .
- Acetic acid is a strong acid and will ionize completely.
- An equilibrium will form between its molecular form,  $\text{HC}_2\text{H}_3\text{O}_2$ , and the species formed by removal of water,  $\text{C}_2\text{H}_2\text{O}$ .

## Review Question 4.19

When or why are double arrows used in reactions? (Several choices may be correct.)

- They are used when a weak acid or weak base reacts with water.
- They are used when a strong acid or strong base reacts with water.
- They are used for reversible reactions.

## Review Question 4.20

Are the following *strong* or *weak* acids?

HCN:   $\text{HNO}_3$ :   $\text{H}_2\text{SO}_3$ :   
 HCl:   $\text{HCHO}_2$ :   $\text{HNO}_2$ :

## Review Question 4.21

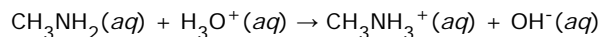
What type of solutions are produced when the following are added to water?

$\text{C}_5\text{H}_5\text{N}$ :   $\text{Ba}(\text{OH})_2$ :  KOH:

$C_6H_5NH_2$ :   $Cs_2O$ :   $N_2O_5$ :

### Review Question 4.22

Methylamine,  $CH_3NH_2$ , reacts with hydronium ion in very much the same way as ammonia.



On the basis of what you have learned so far in this course, which of the following are the most likely structures of  $CH_3NH_2$  and  $CH_3NH_3^+$ ?

- graphic rq4-22a
- graphic rq4-22b
- graphic rq4-22c

### Review Question 4.23

Name the following.

$H_2Se(g)$ :   $H_2Se(aq)$ :

### Review Question 4.24

Iodine, like chlorine, forms several acids. What are the names of the following?

$HIO_4$ :   $HIO_3$ :

$HIO_2$ :   $HIO$ :

$HI$ :

### Review Question 4.25

Name the following ions. Include "ion" in each of your answers.

$IO_4^-$ :   $IO_3^-$ :

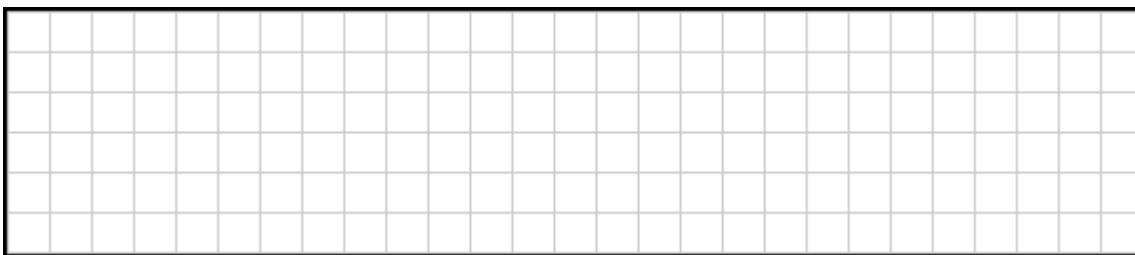
$IO_2^-$ :   $IO^-$ :

$I^-$ :

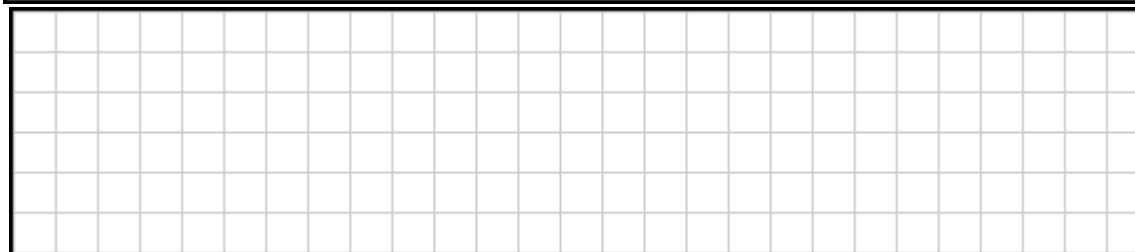
### Review Question 4.26

Write the formula for each of the following. Do not include physical states in your answer.

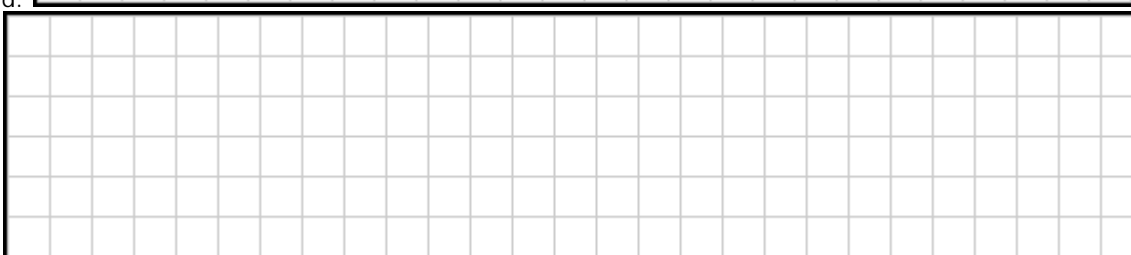
chromic acid:



carbonic acid:



oxalic acid:



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### Review Question 4.27

Name the following.

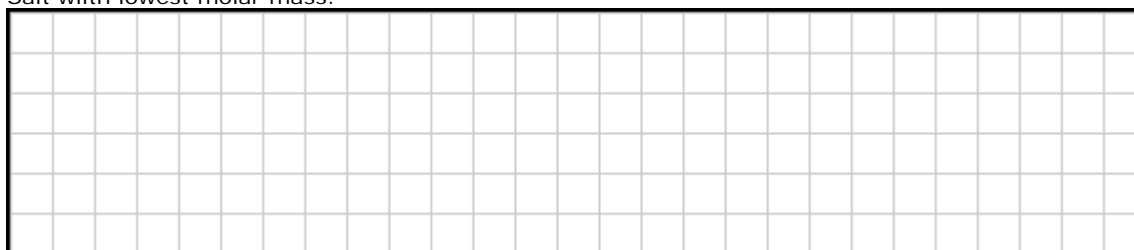
NaHCO<sub>3</sub>:KH<sub>2</sub>PO<sub>4</sub>:(NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub>:

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### Review Question 4.28

H<sub>3</sub>PO<sub>4</sub> can form three salts when it reacts with NaOH. Write the formula of each of these salts. Do not include physical states in your answers.

Salt with lowest molar mass:



Salt with intermediate molar mass:



the name of the acid  $\text{HC}_3\text{H}_5\text{O}_2$ ?

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### Review Question 4.33

Which of the following lead to the existence of a net ionic equation in a reaction between ions? More than one answer may be correct.

- The formation of a gas.
- The formation of a soluble solid.
- The formation of a strong electrolyte.
- The formation of water.
- The formation of a weak electrolyte.
- The formation of an insoluble solid.

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### Review Question 4.34

What is another name for a *metathesis reaction*?

- A single replacement reaction
- A neutralization reaction
- A double replacement reaction
- No correct answer provided.

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### Review Question 4.35

Silver bromide is "insoluble". Which statement(s) are correct for each of the following?

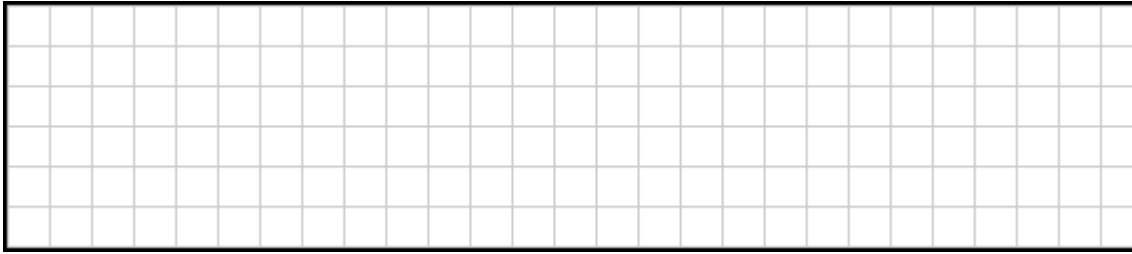
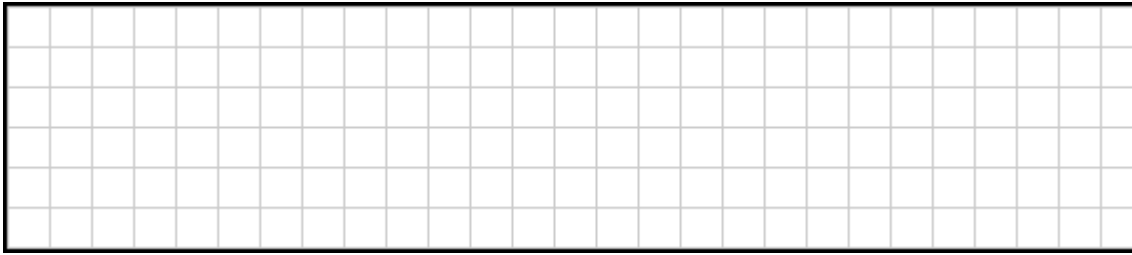
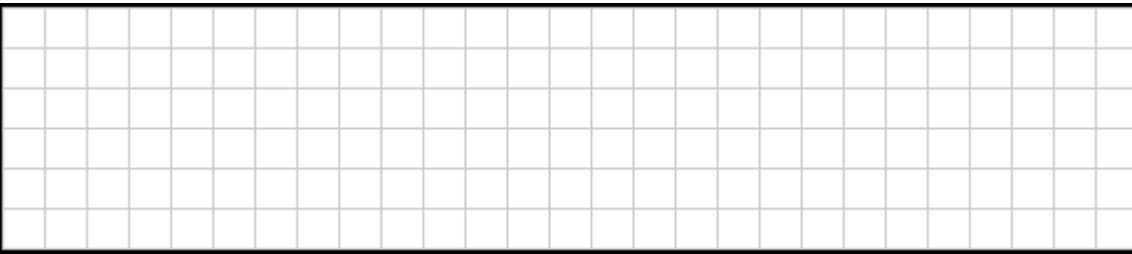
The concentration of  $\text{Ag}^+$  and  $\text{Br}^-$  in a saturated solution of  $\text{AgBr}$  would be:

- Very small.
- Very large.
- More information is needed to answer this question.

When a solution of  $\text{AgNO}_3$  is mixed with a solution of  $\text{NaBr}$ :

- $\text{NaNO}_3$  precipitate will spontaneously form.
- The concentration of  $\text{Ag}^+$  and  $\text{Br}^-$  are momentarily greater than in a saturated solution of  $\text{AgBr}$ .
- $\text{AgBr}$  precipitate will spontaneously form.
- After a few minutes pass, the concentration of  $\text{Ag}^+$  and  $\text{Br}^-$  will be lower than when the two solutions were first mixed.



KOH:	
MgO:	
NH <sub>3</sub> :	

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### Review Question 4.39

Suppose you suspect that a certain solution contains ammonium ion. Which of the following are true? Select all that apply.

- Solutions containing the ammonium ion react with strong acids to produce ammonia.
- Ammonia is easily detected by its odor.
- Ammonia hard to detect because it is odorless.
- Solutions containing the ammonium ion react with strong bases to produce ammonia.

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### Review Question 4.40

What is the name of the gas formed when HCl is added to solutions of the following?

NaHCO<sub>3</sub>:  Na<sub>2</sub>S:  K<sub>2</sub>SO<sub>3</sub>:

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### Review Question 4.41

Answer the following questions by selecting the best answer(s).

What is the definition of *molarity*?

- (g solute)/(mol solution)
- (mol solute)/(L solution)

- (mol solute)/(mol solution)
- (g solute)/(L solution)

Which of the following ratios could be used to prove that mmol/mL is equivalent to mol/L?

- (1 mol/1000 mmol)(1 L/1000 mL)
- (1 mol/1000 mmol)(1000 mL/1 L)
- (1000 mol/1 mmol)(1000 L/1 mL)
- (1000 mol/1 mmol)(1 mL/1000 L)

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### Review Question 4.42

A solution is labeled 0.25 M HCl. Which of these show two conversion factors that correctly relate moles of HCl to volume (in L) of solution?

- (0.25 mol HCl/1.0 L solution) and (1.0 L solution/0.25 mol HCl)
- (0.25 L HCl/1.0 mol solution) and (1.0 mol solution/0.25 L HCl)
- (0.25 mol HCl)(1.0 L solution) and (1.0 L solution)(0.25 mol HCl)

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### Review Question 4.43

When the units *molarity* and *liter* are multiplied, what are the resulting units?

- mol/L
- None of these are correct.
- L
- mol
- mol • L

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### Review Question 4.44

When a solution labeled 0.50 M HNO<sub>3</sub> is diluted with water to give 0.25 M HNO<sub>3</sub>, what happens to the number of moles of HNO<sub>3</sub> in the new solution?

- The number of moles remains constant.
  - The number of moles decreases.
  - The total volume of each solution is required to answer the question.
  - The number of moles increases.
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## Review Question 4.45

Two solutions, "A" and "B", are labeled "0.26 M CaCl<sub>2</sub>" and "0.34 M CaCl<sub>2</sub>", respectively. Both solutions contain the same number of moles of CaCl<sub>2</sub>. If solution B has a volume of 25 mL, what is the volume of solution A?

\*1 mL

*Significant digits are disabled; the tolerance is +/-2%*

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## Review Question 4.46

Select every correct answer dealing with qualitative and quantitative analysis.

- Qualitative analysis: is used to determine what elements are in a substance.
  - Quantitative analysis: answers the question "what is in the sample".
  - Qualitative analysis: answers the question "what is in the sample".
  - Qualitative analysis: is used to determine how much (the percentage) of each element in a substance.
  - Quantitative analysis: answers the question "how much is in the sample".
  - Quantitative analysis: is used to determine what elements are in a substance.
  - Qualitative analysis: answers the question "how much is in the sample".
  - Quantitative analysis: is used to determine how much (the percentage) of each element in a substance.
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## Review Question 4.47

Match each of the following terms with its best single answer:

buret

titration

titrant

end-point

1. A long glass tube used for the controlled, measured addition of a solution to a receiving flask.
  2. A procedure for obtaining quantitative information about a reactant by controlled addition of one substance to another.
  3. The solution delivered from a buret during a titration.
  4. The point during a titration when the titration is stopped and the total added titrant is recorded.
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## Review Question 4.48

Select all that apply to the indicator *phenolphthalein*.

It provides a visual signal that a solution has changed from acid to a base.





(if any) and phase in the parenthesis. For example, " $\text{Al}^{3+}(\text{aq})$ " should be entered as " $\text{Al}(3+)(\text{aq})$ " while " $\text{H}_2\text{PO}_4^{-}(\text{aq})$ " should be entered as " $\text{H}_2\text{PO}_4(-)(\text{aq})$ ", including quotation marks. For each side of the reaction, input the formulas of cations first (if any), then neutral species (if any), and then anions (if any).

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## Review Problem 4.64

Predict which compounds are *soluble* in water.

- $\text{HgBr}_2$
  - $\text{Hg}_2\text{Br}_2$
  - $\text{Sr}(\text{NO}_3)_2$
  - $(\text{NH}_4)_3\text{PO}_4$
  - $\text{PbI}_2$
  - $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$
- 
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## Review Problem 4.78

Suppose that you wished to prepare copper(II) carbonate by a precipitation reaction involving  $\text{Cu}^{2+}$  and  $\text{CO}_3^{2-}$ . Select all of the pairs of reactants that could be used as solutes.

- $\text{Cu}(\text{NO}_3)_2$  and  $\text{CaCO}_3$
  - $\text{CuSO}_4$  and  $(\text{NH}_4)_2\text{CO}_3$
  - $\text{Cu}(\text{OH})_2$  and  $\text{Na}_2\text{CO}_3$
  - $\text{CuCl}_2$  and  $\text{K}_2\text{CO}_3$
  - $\text{CuS}$  and  $\text{NiCO}_3$
- 
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## Review Problem 4.80

Calculate the molarity of a solution that contains  
(a) 16.2 g of sulfuric acid in 283.1 mL of solution.

<sup>\*1</sup> M

*Significant digits are disabled; the tolerance is +/-2%*

(b)  $3.3 \times 10^{-3}$  mol iron(II) nitrate in 93.1 mL of solution.

<sup>\*1</sup> M

*Significant digits are disabled; the tolerance is +/-2%*

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## Review Problem 4.82

How many milliliters of 0.702 M  $\text{HNO}_3$  contain 3.35 g  $\text{HNO}_3$ ?

<sup>\*1</sup> mL

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.83

Calculate the number of grams of  $\text{H}_2\text{SO}_4$  needed to make 475 mL of 0.759 M solution.

\*1 g

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.84

How many grams of solute are needed to make each of the following solutions?

(a) 151 mL of 0.345 M potassium sulfate

\*1 grams

Significant digits are disabled; the tolerance is +/-2%

(b) 334.4 mL of 0.298 M iron(III) chloride

\*1 grams

Significant digits are disabled; the tolerance is +/-2%

(c) 583.7 mL of 0.567 M barium acetate

\*1 grams

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.86

A 400 mL sample of 0.86 M  $\text{HNO}_3$  is diluted to 750 mL. What is the molarity of the resulting solution?

\*1 M

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.87 GO Tutorial

To what volume must 11.2 mL of 18.0 M  $\text{H}_2\text{SO}_4$  be diluted to produce 7.16 M  $\text{H}_2\text{SO}_4$ ?

\*1 mL would be required.

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.88

To what volume (in mL) must 70.0 mL of 1.65 M HCl be diluted to produce 0.550 M HCl?

\*1 mL

Significant digits are disabled; the tolerance is +/-2%

## Review Problem 4.90

How many milliliters of water must be added to 134 mL of 1.50 M HCl to give 1.00 M HCl?

\*1 mL

*Significant digits are disabled; the tolerance is +/-2%*

## Review Problem 4.93

Calculate the concentrations of each of the ions in 0.13 M BeSO<sub>4</sub>.

a) [Be<sup>2+</sup>], M

b) [SO<sub>4</sub><sup>2-</sup>], M

(a) \*1 M

(b) \*2 M

**Answer \*1:** *significant digits are disabled; the tolerance is +/-2%*

**Answer \*2:** *significant digits are disabled; the tolerance is +/-2%*

## Review Problem 4.96

In a solution of NaNO<sub>3</sub>, the Na<sup>+</sup> concentration is 0.0127 M. How many grams of NaNO<sub>3</sub> are in 244 mL of this solution?

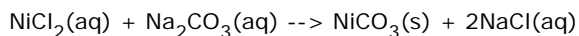
\*1 g

*Significant digits are disabled; the tolerance is +/-2%*

## Review Problem 4.97

How many milliliters of 0.334 M Na<sub>2</sub>CO<sub>3</sub> solution are needed to react completely with 45.9 mL of 0.483 M NiCl<sub>2</sub> solution?

How many grams of NiCO<sub>3</sub> will be formed? The reaction is



(a) \*1 mL

(b) \*2 g

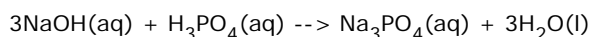
**Answer \*1:** *significant digits are disabled; the tolerance is +/-2%*

**Answer \*2:** *significant digits are disabled; the tolerance is +/-2%*

## Review Problem 4.98

How many milliliters of 0.344 M NaOH solution are needed to completely neutralize 41.6 mL of 0.302 M H<sub>3</sub>PO<sub>4</sub> solution?

The reaction is



\*1 mL

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.99

What is the molarity of an aqueous solution of NaOH if 30.08 mL is exactly neutralized by 17.88 mL of 0.126 M HBr?

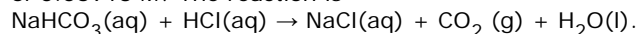
\*1 M

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.102

How many grams of baking soda, NaHCO<sub>3</sub>, are needed to react with 183 mL of stomach acid having an HCl concentration of 0.06913 M? The reaction is

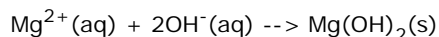
\*1 g

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.104

How many grams of sodium hydroxide are needed to react completely with 73.2 mL of 0.285 M MgCl<sub>2</sub> solution? The net ionic equation for the reaction is

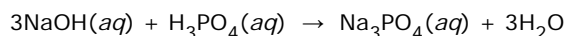
\*1 g

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.105 GO Tutorial

How many milliliters of 6.35 M NaOH are needed to completely neutralize 59.8 mL of 0.898 M H<sub>3</sub>PO<sub>4</sub>? The reaction is

 mL would be required.

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.112

A 14.4 mL sample of vinegar, containing acetic acid, HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub>, was titrated using 0.5297 M NaOH solution. The titration required 16.66 mL of the base. What was the molar concentration of acetic acid in the vinegar?

Significant digits are disabled; the tolerance is +/-2%

A 13.0 mL sample of vinegar, containing acetic acid,  $\text{HC}_2\text{H}_3\text{O}_2$ , was titrated using 0.6552 M NaOH solution. The titration required 19.31 mL of the base. Assuming the density of the vinegar to be 1.0 g/mL, what was the percent (by mass) of acetic acid in the sample?

\*1

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.113 GO Tutorial

In a titration, 44.04 mL of 0.739 M NaOH was needed to react with 64.7 mL of HCl solution. What is the molarity of the acid?

 M

Significant digits are disabled; the tolerance is +/-2%

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## Review Problem 4.114

Ascorbic acid (vitamin C) is a diprotic acid having the formula  $\text{H}_2\text{C}_6\text{H}_6\text{O}_6$ . A sample of a vitamin supplement was analyzed by titrating a 0.4868 g sample dissolved in water with 0.0713 M NaOH. A volume of 14.28 mL of the base was required to completely neutralize the ascorbic acid. What was the percentage by mass of ascorbic acid in the sample?

\*1 % ascorbic acid

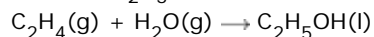
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## Review Problem 4.115

Ethanol ( $\text{C}_2\text{H}_5\text{OH}$ ) is synthesized for industrial use by the following reaction, carried out at very high pressure.



What is the maximum amount of ethanol (in grams) that can be produced when 1.6 kg of ethylene ( $\text{C}_2\text{H}_4$ ) and 0.019 kg of steam are placed into the reaction vessel?

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## Review Problem 4.116

A sample of iron chloride weighing 0.300 g was dissolved in water and the solution was treated with  $\text{AgNO}_3$  to precipitate the chloride as  $\text{AgCl}$ . After precipitation was complete, the  $\text{AgCl}$  was filtered, dried, and found to weigh 0.678 g. Determine the empirical formula of the iron chloride.

FeCl

- $\text{Fe}_2\text{Cl}_2$
- $\text{FeCl}_2$
- $\text{Fe}_3\text{Cl}_2$
- $\text{FeCl}_3$

## Review Problem 4.118

An ore of barium contains  $\text{BaCO}_3$ . A 1.367 g sample of the ore was treated with HCl to dissolve the  $\text{BaCO}_3$ . The resulting solution was filtered to remove insoluble material and then treated with  $\text{H}_2\text{SO}_4$  to precipitate  $\text{BaSO}_4$ . The precipitate was filtered, dried, and found to weigh 1.259 g. What is the percentage by mass of barium in the original sample?

\*1 % Ba

*Significant digits are disabled; the tolerance is +/-2%*

## Review Problem 4.120

A mixture was known to contain both  $\text{KNO}_3$  and  $\text{K}_2\text{SO}_3$ . To 0.4954 g of the mixture, dissolved in enough water to give 50.00 mL of solution, were added 50.00 mL of 0.150 M HCl (an excess of HCl). The reaction mixture was heated to drive off all of the  $\text{SO}_2$ , and then 25.00 mL of the reaction mixture was titrated with 0.100 M KOH. The titration required 12.18 mL of the KOH solution to reach an end point. What was the percentage by mass of  $\text{K}_2\text{SO}_3$  in the original mixture of  $\text{KNO}_3$  and  $\text{K}_2\text{SO}_3$ ?

\*1

*Significant digits are disabled; the tolerance is +/-2%*

## Additional Exercise 4.121

Over the next pages, you will classify each of the following as an strong electrolyte, weak electrolyte, or nonelectrolyte.

- |  |   |
|--|---|
| KCl  | $\text{HC}_2\text{H}_3\text{O}_2$ (acetic acid) |
| $\text{C}_3\text{H}_5(\text{OH})_3$ (glycerin)                     | $\text{CH}_3\text{OH}$ (methyl alcohol)         |
| NaOH   | $\text{H}_2\text{SO}_4$                         |
| $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ (sucrose or table sugar) | $\text{NH}_3$                                   |

Which of the following are nonelectrolytes? (several answers may be correct)

- $\text{C}_{12}\text{H}_{22}\text{O}_{11}$  (sucrose, or table sugar)
- $\text{NH}_3$
- $\text{CH}_3\text{OH}$  (methyl alcohol)
- KCl

$\text{C}_3\text{H}_5(\text{OH})_3$  (glycerin)

- 
- NaOH
- HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> (acetic acid)
- H<sub>2</sub>SO<sub>4</sub>

Which of the following are strong electrolytes? (Several choices may be correct.)

- HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> (acetic acid)
- C<sub>3</sub>H<sub>5</sub>(OH)<sub>3</sub> (glycerin)
- NH<sub>3</sub>
- NaOH
- KCl
- H<sub>2</sub>SO<sub>4</sub>
- C<sub>12</sub>H<sub>22</sub>O<sub>11</sub> (sucrose, or table sugar)
- CH<sub>3</sub>OH (methyl alcohol)

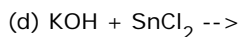
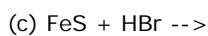
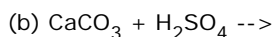
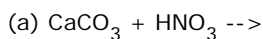
Which are the following are weak electrolytes? (Several choices may be correct.)

- CH<sub>3</sub>OH (methyl alcohol)
- H<sub>2</sub>SO<sub>4</sub>
- C<sub>12</sub>H<sub>22</sub>O<sub>11</sub> (sucrose, or table sugar)
- NH<sub>3</sub>
- HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> (acetic acid)
- KCl
- C<sub>3</sub>H<sub>5</sub>(OH)<sub>3</sub> (glycerin)
- NaOH

---

## Additional Exercise 4.122

In the following pages, you will determine first if a reaction occurs. If a reaction occurs, you will then enter in either the molecular, ionic, or net ionic equation. Here are the reactions you will be evaluating



Which of the following actually lead to reactions? (multiple answers may be correct)

- $\text{KOH} + \text{SnCl}_2 \rightarrow$





- (1) percentage composition of the acid
  - (2) the empirical formula
  - (3) the molecular formula
  - (4) the protonation state of the acid
- A trial balance will not balance if

- a journal entry is only partially posted.
- a journal entry is posted twice.
- a wrong amount is used in journalizing.
- incorrect account titles are used in journalizing.

---

## Additional Exercise 4.126

How many milliliters of 0.10 M HCl must be added to 53.4 mL of 0.40 M HCl to give a final solution that has a molarity of 0.25 M?

 \*1 

*Significant digits are disabled; the tolerance is +/-2%*

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