

# Reaction Rates and Equilibrium



**Directions:** Answer the following questions using complete sentences.

1.	. What is a catalyst?					
	. What is an inhibitor?					
2.						
3.	What is the reaction rate for a chemical reaction?					
4.	What does Le Chatelier's principle state?					
	ections: Decide if each reaction below involves a catalyst, an inhibitor, or neither. Write C for catalyst, I for ibitor, or N for neither in the blank at the left.					
_	<ol><li>Brushing the cut edges of fruits with lemon juice can prevent the darkening effect that contact with air can cause.</li></ol>					
_	6. In the human body, proteins called enzymes help to speed up chemical processes.  The proteins are not changed during these chemical processes.					
-	7. Aluminum oxide, which forms on exposed aluminum, protects the aluminum from further reaction with the air.					
_	8. Food preservatives called BHT and BHA slow down the spoilage of certain foods.					
	9. Nickel is used to increase the rate of methane formation from the addition of hydrogen and carbon monoxide. Nickel does not permanently change.					
Dire	ections: Complete each statement.					
10.	A reaction that can occur in both the forward and the reverse direction is called a(n)					
11.	is a state in which the forward and reverse reactions balance each other because they take place at equal rates.					
12.	At equilibrium, the concentrations of reactants and products are					
	but that does not mean that the amounts or concentrations are					

# Section 3 • Chemical Reactions and Energy Section 4 • Reaction Rates and Equilibrium

**Directions:** Read the following passage. Then answer the questions on the lines provided.

Carlos was camping and getting cold as the sun went down. He wanted to light a fire for warmth and light. However, he discovered that the nearby wood was wet, and would not light. He had to look under some leaves and debris to find dry wood. He piled the wood and surrounded it with a circle of stones to keep the fire contained. Then he put some dry leaves around the logs to help the fire get started. He lit the leaves. Soon the leaves had burned away, his fire was burning nicely, and Carlos was getting warmer.

	Is the chemical reaction produced by Carlos's fire exergonic or endergonic?  How do you know?  Is the reaction in Carlos's fire endothermic or exothermic? Explain.					
2. Is t						
3. Do	you think the leaves were a catalyst for the fire	? Why or why not?				
	· ·					
	ons: Match the terms in Column II with the descriptions in Colu lank at the left.	mn I. Write the letter of the correct term				
Colun	nn I	Column II				
	4. Substance that speeds up a chemical reaction without being a part of it	a. Le Chatelier's principle				
_	5. States that atoms, ions, and molecules must collide to react	<ul><li>b. equilibrium</li><li>c. catalyst</li></ul>				
	6. Forward and reverse reactions proceed at equal rates	d. reaction rate				
	7. Food preservative is an example	<ul><li>e. collision model</li><li>f. inhibitor</li></ul>				
	8. Stress applied to the products shifts the	at manufacca				

9. The rate at which reactants change into

products

## **Chemical Reactions**

### Part A. Vocabulary Review

**Directions:** Complete the following sentences using the terms listed below.

	syntnesis	exothermic	catalyst	decomposition	COCINCIENTS	
	endothermic	single-c	displacement	inhibitor	reactants	
P			double-displacemen		balanced	
1.	A change in wh	ich one or moi	re substances are conve	rted into a new subs	tance is called a(n)	
				8		
2.	If a precipitate,	water, or a gas	forms when two ionic	compounds in solut	ion are combined,	
	the reaction is a	a(n)	reaction	ı.		
3.			ain chemical reactions	A CONTRACTOR OF THE CONTRACTOR	*	
4.	When two or n	nore substances	combine in a chemica	l reaction to form an	nother substance,	
	a(n)		reaction has taken place	ce.		
5.	The breakdown	n of a substance	into two or more sim	pler substances is a(r	1)	
		react	ion.			
6.	In a chemical e	quation, the su	bstances that react are	called		
7. A substance that speeds up a chemical reaction without itself being permanently cha						
	a(n)					
			y in the form of heat is			
	has occurred.		nother in a compound,			
10.	If the energy re	leased in a che	mical reaction is prima	rily in the form of h	eat, that reaction is	
			reaction.	•		
			ls and formulas in an ec			
12.			element on the left sid			
			ight side of the equation			
		_	bstances that are produ			
14.	An insoluble so	olid that forms	when two ionic compo	ounds in solution are	combined is	
	a(n)		,		e	



#### I. Testing Concepts

Chapter

Test B

**Directions:** For each of the following, write the letter of the term or phrase that best completes the sentence or answers the question.

	1.	Substances that pre- a. endothermics.	vent certain chemica b. catalysts.	l reactions are called c. inhibitors.	d. products.	
<del></del>	2.	When one element a reaction.  a. synthesis b. single-displacem		nent in a compound, to  c. decomposition d. double-displacen		
-	3.	Each substance to the catalyst.	he right of the arrow b. precipitate.	in a chemical equation c. reactant.	n is a d. product.	
	4.			released is primarily in	3	
		a. flammable.	<b>b.</b> exothermic.	c. endothermic.	a. endergonic.	
	5.	change itself is a(n)	<del></del>	eaction without underg		
		a. inhibitor.	<b>b.</b> coefficient.	c. reactant.	d. catalyst.	
<del>,</del>	6.		de symbols and form  b. superscripts.	ulas in a chemical equa c. fractions.	tion are called d. coefficients.	
	7.	substance is a		re substances combine c. reactant	d. product	
	_	•	54 T	. ,	<u>-</u>	
	8.	a. displacement.		wo or more substances c. decomposition.	d. endothermic.	
	9.		the left side of the arr b. product.	ow in a chemical equa c. coefficient.	tion is a d. catalyst.	
	10.	reaction is		for a chemical reaction	•	
		a. exothermic.	b. reactant.	c. balanced.	d. endothermic.	
	11.	In a chemical equat a. (s).		means "dissolved in wa	d. (g).	
	12.	An example of a bal		tion is		
a. AgNO <sub>3</sub> + NaCl→4AgCl + 2NaNO <sub>3</sub> .						
	b. $2AgNO_3 + 2NaCl \rightarrow 3AgCl + 2NaNO_3$ . c. $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$ . d. $AgNO_3 + 2NaCl + AgCl \rightarrow AgCl + 3NaNO_3$ .					
		a. AgnO3 + ZNaCI	T VACT → VACT + 21	Nation.		