

# KEY

## Unit 9 Outline- Thermodynamics, Reaction Rates, & Chemical Equilibrium Chapters 17 & 18

### Essential Skills/ State Standards:

- 9-1. Describe how temperature and heat flow in terms of the motion of molecules (or atoms). (CSS: 7a)  
 9-2. Know that chemical processes & phase changes can either release energy (exothermic) or absorb energy (endothermic). (CSS: 7b, 7c)  
 9-3. Solve problems involving heat flow and temperature changes, using known values of specific heat ( $q = m \cdot c \cdot \Delta T$ ) & latent heat of phase change ( $q = m \cdot \Delta H$ ). (CSS: 7d)  
 9-4. Know the rate of reaction is the decrease in concentration of reactants or the increase in concentration of products with time & depends on such factors as: concentration, temperature, and pressure. (CSS: 8a, 8b)  
 9-5. Know the definition and role of activation energy & catalyst in a chemical reaction. (CSS: 8d\*, 8c)  
 9-6. Know how to use Le Chatelier's principle to predict the effect of changes in concentration, temperature, and pressure. (CSS: 9a)  
 9-7. Know that equilibrium is established when the forward and reverse reaction rates are equal. (CSS: 9b)

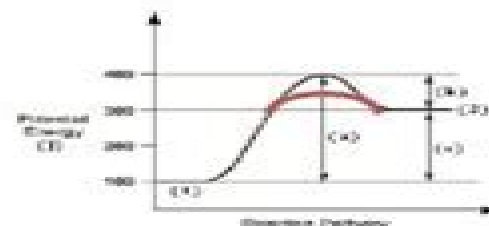
### Vocabulary

- |                |                   |  |                            |
|----------------|-------------------|--|----------------------------|
| • Condensation | • Deposition      | • Calorimeter                                  | • Heat of reaction         |
| • Freezing     | • Heat            | • Joule  | • Le Chatelier's principle |
| • Vaporization | • Temperature     | • Specific heat                                | • Equilibrium              |
| • Melting      | • Thermochemistry | • $q = m \cdot c \cdot \Delta T$               | • Activation Energy        |
| • Boiling      | • Exothermic      | • $q = m \cdot \Delta H_{\text{vaporization}}$ | • Catalyst                 |
| • Sublimation  | • Endothermic     | • $q = m \cdot \Delta H_{\text{fusion}}$       |                            |

### Study Guide (Use notes, worksheets, and labs in addition to this study guide)

- According to the collision theory, what 3 things must happen in order for two molecules to react?  
**Must collide with each other, Must collide with enough energy, & in the correct orientation**
- What is the importance of the activation energy in a chemical reaction?  
**Amount of energy needed for a reaction to occur.**
- Using the collision theory, explain if the following would increase/ decrease the rate of reaction:  
 $2 \text{HCl(aq)} + \text{Mg(s)} \rightarrow \text{MgCl}_2\text{(aq)} + \text{H}_2\text{(g)}$ 
  - Increase temp: **Increase, molecules collide more**
  - Increase HCl: **Increase, more collisions because more reactants to collide**
  - Increase pressure: **Hard to say, wouldn't affect the reactants directly because none of them are gases. One of the products is a gas, so it might cause the gas particles to collide more with the reactants and could slow it down. Tough call.. (this one won't be on the test).**
  - Remove  $\text{MgCl}_2$ : **Increase, less products means less chance for them to interfere with reactant collisions**
  - Add  $\text{H}_2$ : **Decrease, more products mean they interfere more with reactants and the reactants would collide less.**
- Identify the following terms with their correct letter from the graphs:  

• Reactants- <b>I</b>	• Products- <b>2</b>
• Activation energy- <b>A</b>	
• Is this reaction exothermic or endothermic? <b>Endothermic</b>	
- Explain how a catalyst affects the activation energy in a chemical reaction. (Also, show on the above graph what a catalyst might do). It lowers the activation energy (see on graph)



# Chemistry Quiz 18 Reaction Rates Answer Key

**William H. Brown, Thomas Poon**



## **Chemistry Quiz 18 Reaction Rates Answer Key:**

*Brown's Introduction to Organic Chemistry* William H. Brown, Thomas Poon, 2017-06-28 Introduction to Organic Chemistry 6th Global Edition provides an introduction to organic chemistry for students who require the fundamentals of organic chemistry as a requirement for their major It is most suited for a one semester organic chemistry course In an attempt to highlight the relevance of the material to students the authors place a strong emphasis on showing the interrelationship between organic chemistry and other areas of science particularly the biological and health sciences The text illustrates the use of organic chemistry as a tool in these sciences it also stresses the organic compounds both natural and synthetic that surround us in everyday life in pharmaceuticals plastics fibers agrochemicals surface coatings toiletry preparations and cosmetics food additives adhesives and elastomers

**Student Guide For Living Chemistry** Barbara Ucko, 2012-12-02 Student Guide for Living Chemistry is a 23 chapter textbook guide that allows students to study and review on their own and test their understanding to help them prepare for examinations Every chapter begins with a list of objectives stating exactly the skills to develop in a particular unit Each objective corresponds to a section in the textbook Living Chemistry Three kinds of questions are provided for each objective to check the student's understanding namely short answer Study Questions multiple choice and fill in The answers for all questions are provided at the end of the chapter The opening chapters cover the SI units composition of matter chemical bonding compounds chemical change gases respiration and water The subsequent chapters deal with solutions acids bases salts nuclear and organic chemistry oxygen derivatives and hydrocarbons polymers and other organic derivatives This textbook also explores the chemistry of carbohydrates lipids proteins enzymes and energy and carbohydrate metabolism The remaining chapters discuss the chemistry of vitamins hormones body fluid drugs and poisons Undergraduate chemistry students will find this book invaluable

*Chemical Interactions*, 2005

*Introduction to Organic Chemistry* William H. Brown, Thomas Poon, 2016-01-13 Introduction to Organic Chemistry 6th Edition provides an introduction to organic chemistry for students who require the fundamentals of organic chemistry as a requirement for their major It is most suited for a one semester organic chemistry course In an attempt to highlight the relevance of the material to students the authors place a strong emphasis on showing the interrelationship between organic chemistry and other areas of science particularly the biological and health sciences The text illustrates the use of organic chemistry as a tool in these sciences it also stresses the organic compounds both natural and synthetic that surround us in everyday life in pharmaceuticals plastics fibers agrochemicals surface coatings toiletry preparations and cosmetics food additives adhesives and elastomers This text is an unbound three hole punched version Access to WileyPLUS sold separately

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Chiras,2005 Intended for non majors this textbook describes the structure and functions of each human body system explores the body processes that regulate chemical levels in the blood and body temperature and overviews genetics human reproduction and evolution The fifth edition trims the overall length by 20% while adding short essays on past scientific

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Edition McGraw Hill,2001-02-12 Contains all of the information in Health Making Life Choices Regular Edition PLUS two chapters on understanding sexuality and preventing pregnancy and sexually transmitted diseases Health Making Life Choices gives students the important decision making skills and information they need to promote their own good health It teaches the self responsibility and skills needed to allow students to make wise lifestyle choices the key to living a long and happy life Topics include Family Life Dealing with Conflicts Alternative Therapies The Environment and Your Health Teenagers and Violence and Refusal Skills      *Te HS&T 2007 Shrt Crs M* Holt Rinehart & Winston,2007      **Whitaker's**

**Books in Print** ,1998

## **Chemistry Quiz 18 Reaction Rates Answer Key** Book Review: Unveiling the Magic of Language

In an electronic era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its power to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "**Chemistry Quiz 18 Reaction Rates Answer Key**," compiled by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound effect on our existence. Throughout this critique, we will delve to the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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