

7. molar heat of condensation

Part B True-False

8. AT 10. ST 12. NT
9. NT 11. NT

Part C Matching

13. a 15. b 17. d
14. e 16. c

Part D Questions and Problems

18. a. endothermic d. endothermic
b. endothermic e. exothermic
c. exothermic f. exothermic

$$19. \Delta H = 28.3 \frac{\text{g H}_2\text{O}(g)}{1 \text{ mol H}_2\text{O}(g)} \times \frac{1 \text{ mol H}_2\text{O}(g)}{18.0 \text{ g H}_2\text{O}(g)} \\ \times \frac{6.01 \text{ kJ}}{1 \text{ mol H}_2\text{O}(g)} = 9.45 \text{ kJ}$$

$$20. \Delta H = 5.53 \frac{\text{mol NH}_4\text{NO}_3(g)}{1 \text{ mol NH}_4\text{NO}_3(g)} \\ \times \frac{25.7 \text{ kJ}}{1 \text{ mol NH}_4\text{NO}_3(g)} = 142 \text{ kJ}$$

Section 17.4

Part A Completion

- sum
- enthalpy
- indirectly
- changed (reversed)
- standard heat of formation
- change
- one
- ΔH_f°
- zero
- subtracting

Part B True-False

11. NT 13. AT 15. NT
12. NT 14. NT

Part C Matching

16. b 18. a 20. c
17. c 19. d

Part D Questions and Problems



$$22. \Delta H_f^\circ (\text{products}) \\ = 3 \frac{\text{mol CO}_2(g)}{1 \text{ mol CO}_2(g)} \times \frac{-393.5 \text{ kJ}}{1 \text{ mol CO}_2(g)} \\ = -1181 \text{ kJ} \\ \Delta H_f^\circ (\text{reactants}) \\ = 3 \frac{\text{mol CO}(g)}{1 \text{ mol CO}(g)} \times \frac{-110.5 \text{ kJ}}{1 \text{ mol CO}(g)} + (-822.1 \text{ kJ}) \\ = -1154 \text{ kJ} \\ \Delta H^\circ = \Delta H_f^\circ (\text{products}) - \Delta H_f^\circ (\text{reactants}) \\ = -1181 \text{ kJ} - (-1154 \text{ kJ}) \\ = -27 \text{ kJ}$$

Practice Problems

Section 17.1

- $200.0 \text{ Cal} \times \frac{1000 \text{ cal}}{1 \text{ Cal}} \times \frac{4.184 \text{ J}}{1 \text{ cal}} \times \frac{1 \text{ kJ}}{10^3 \text{ J}} \\ = 836.8 \text{ kJ}$
- $C = \frac{525.0 \text{ cal}}{25.0 \text{ g} \times 15.0^\circ\text{C}} = 1.40 \text{ cal/(g} \times ^\circ\text{C)}$
- $\Delta T = \frac{1255.0 \text{ J}}{100.0 \text{ g} \times 2.1 \text{ J/(g} \times ^\circ\text{C)}} = 6.0^\circ\text{C}$
- $q = 100.0 \text{ g} \times 120.0^\circ\text{C} \times 0.90 \frac{\text{J}}{\text{g} \times ^\circ\text{C}} \\ = 1.1 \times 10^4 \text{ J}$

Section 17.2

- $\Delta H = 150.0 \text{ g} \times 4.18 \frac{\text{J}}{\text{g} \times ^\circ\text{C}} \times 10^\circ\text{C} \\ = 6.3 \times 10^3 \text{ J} = 6.3 \text{ kJ}$
- $\Delta H = 15.0 \text{ g Ca(OH)}_2(g) \times \frac{1 \text{ mol Ca(OH)}_2(g)}{74.1 \text{ g Ca(OH)}_2(g)} \\ \times \frac{-65.2 \text{ kJ}}{1 \text{ mol Ca(OH)}_2(g)} = -13.2 \text{ kJ}$
- $\Delta H = 52.4 \text{ g CH}_4(g) \times \frac{1 \text{ mol CH}_4(g)}{16.0 \text{ g CH}_4(g)} \\ \times \frac{-890.2 \text{ kJ}}{1 \text{ mol CH}_4(g)} = 2.93 \times 10^3 \text{ kJ}$
- $4\text{NH}_3 + 5\text{O}_2(g) \rightarrow 4\text{NO}(g) + 6\text{H}_2\text{O}(g) \\ \Delta H = \frac{-226 \text{ kJ}}{1 \text{ mol NH}_3(g)} \times 4 \text{ mol NH}_3(g) \\ = -904 \text{ kJ}$

Prentice Hall Chemistry Section 2 Solutions Answers

Irving J. Levinson



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Table of Contents Prentice Hall Chemistry Section 2 Solutions Answers

1. Understanding the eBook Prentice Hall Chemistry Section 2 Solutions Answers
 - The Rise of Digital Reading Prentice Hall Chemistry Section 2 Solutions Answers
 - Advantages of eBooks Over Traditional Books
2. Identifying Prentice Hall Chemistry Section 2 Solutions Answers
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Prentice Hall Chemistry Section 2 Solutions Answers
 - User-Friendly Interface
4. Exploring eBook Recommendations from Prentice Hall Chemistry Section 2 Solutions Answers
 - Personalized Recommendations
 - Prentice Hall Chemistry Section 2 Solutions Answers User Reviews and Ratings
 - Prentice Hall Chemistry Section 2 Solutions Answers and Bestseller Lists
5. Accessing Prentice Hall Chemistry Section 2 Solutions Answers Free and Paid eBooks
 - Prentice Hall Chemistry Section 2 Solutions Answers Public Domain eBooks
 - Prentice Hall Chemistry Section 2 Solutions Answers eBook Subscription Services
 - Prentice Hall Chemistry Section 2 Solutions Answers Budget-Friendly Options

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 - ePub, PDF, MOBI, and More
 - Prentice Hall Chemistry Section 2 Solutions Answers Compatibility with Devices
 - Prentice Hall Chemistry Section 2 Solutions Answers Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Prentice Hall Chemistry Section 2 Solutions Answers
 - Highlighting and Note-Taking Prentice Hall Chemistry Section 2 Solutions Answers
 - Interactive Elements Prentice Hall Chemistry Section 2 Solutions Answers
8. Staying Engaged with Prentice Hall Chemistry Section 2 Solutions Answers
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Prentice Hall Chemistry Section 2 Solutions Answers
9. Balancing eBooks and Physical Books Prentice Hall Chemistry Section 2 Solutions Answers
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Prentice Hall Chemistry Section 2 Solutions Answers
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Prentice Hall Chemistry Section 2 Solutions Answers
 - Setting Reading Goals Prentice Hall Chemistry Section 2 Solutions Answers
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Prentice Hall Chemistry Section 2 Solutions Answers
 - Fact-Checking eBook Content of Prentice Hall Chemistry Section 2 Solutions Answers
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
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 - Integration of Multimedia Elements

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