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Chapter 1

Thermochemistry – Energy Flow and Chemical Change

Key terms

thermodynamics The study of heat (thermal energy) and its interconversions.

thermochemistry The branch of thermodynamics that focuses on the heat involved in chemical and physical change.

internal energy (E) The sum of the kinetic and potential energies of all the particles in a system.

heat (q) The energy transferred between objects because of a difference in their temperatures only.

work (w) The energy transferred when an object is moved by a force.

state function A property of the system determined by its current state, regardless of how it arrived at that state.

pressure-volume work (PV work) A type of work in which a volume change occurs against an external pressure.

isobaric process A thermodynamic process in which the pressure stays constant.

isochoric process A thermodynamic process in which the volume remains constant.

isothermal process A thermodynamic process in which the temperature of a system remains constant.

adiabatic process A thermodynamic process in which no heat is gained or lost by the system.

first law of thermodynamics A basic

observation that the total energy of the universe is constant; thus, $\Delta E_{\text{universe}} = \Delta E_{\text{system}} + \Delta E_{\text{surroundings}} = 0$.

enthalpy (H) A thermodynamic quantity that is the sum of the internal energy plus the product of the pressure and volume.

change in enthalpy (ΔH) The change in internal energy plus the product of the constant pressure and the change in volume: $\Delta H = \Delta E + P\Delta V$; the heat lost or gained at constant pressure: $\Delta H = q_p$.

enthalpy diagram A graphic depiction of the enthalpy change of a system.

exothermic process A process that occurs with a release of heat to the surroundings and therefore a decrease in the enthalpy of the system ($\Delta H < 0$).

endothermic process A process that occurs with an absorption of heat from the surroundings and therefore an increase in the enthalpy of the system ($\Delta H > 0$).

heat capacity The quantity of heat required to change the temperature of an object by 1 K.

specific heat capacity (c) The quantity of heat required to change the temperature of 1 gram of a material by 1 K.

molar heat capacity (C) The quantity of heat required to change the temperature of 1 mol of a substance by 1 K.

Chapter Thermochemistry Energy Flow And Chemical Change

Brady



Chapter Thermochemistry Energy Flow And Chemical Change:

Ebook: Chemistry: The Molecular Nature of Matter and Change Silberberg, 2015-01-16 Ebook Chemistry The Molecular Nature of Matter and Change **Instructor's Resource Manual** Silberberg, 1999-07 **CHEMISTRY** SILBERBERG, 2003 **Student Solutions Manual: Ssm Chemistry** Deborah Wiegand, 2003 This manual contains complete worked out solutions to all follow up problems and about half of all the chapter problems Each chapter of solutions opens with a summary of the text chapter content and a list of key equations needed to solve the problems **Chemistry** Martin Stuart Silberberg, 1996 This general chemistry text centres on the theme that observable change in chemical systems is the result of molecular change The aims of this edition are to enable students to perceive matter and change at the molecular level and to help build student confidence in their ability to solve chemical problems as they discover the relevance of chemistry to their lives **Chemistry** Neil D. Jespersen, Alison Hyslop, 2021-11-02 Chemistry The Molecular Nature of Matter 8th Edition continues to focus on the intimate relationship that exists between structure at the atomic molecular level and the observable macroscopic properties of matter Key revisions in this edition focus on three areas The deliberate inclusion of more updated real world examples that relate common real world student experiences to the science of chemistry Simultaneously examples and questions have been updated to align them with career concepts relevant to the environmental engineering biological pharmaceutical and medical sciences Providing students with transferable skills with a focus on integrating metacognition and three dimensional learning into the text When students know what they know they are better able to learn and incorporate the material Providing a total solution through New WileyPLUS by fully integrating the enhanced etext with online assessment answer specific responses and additional practice resources The 8th edition continues to emphasize the importance of applying concepts to problem solving to achieve high level learning and increase retention of chemistry knowledge Problems are arranged in an intuitive confidence building order *Student Solutions Manual* Deborah Wiegand, 1999-07 **Inorganic Chemistry** Horace Greeley Byers, 1917 **Compend of Mechanical Refrigeration and Engineering** John Ewald Siebel, 1906 **Compend of Mechanical Refrigeration and Engineering** John Ewald Siebel, 1918 **Addison-Wesley Chemistry** Antony C. Wilbraham, Dennis D. Staley, Michael S. Matta, Edward L. Waterman, Prentice-Hall Staff, 2001-02 To purchase or download a workbook click on the Purchase or Download button to the left To purchase a workbook enter the desired quantity and click Add to Cart To download a free workbook right click the FREE Download PDF link and save to your computer This will result in a faster download as opposed to left clicking and opening the link *Chemical Process Principles: Material and energy balances* Olaf Andreas Hougen, Kenneth M. Watson, 1943 **General Chemistry** Brady, 1990-01-02 *A Text Book of Thermo-chemistry and Thermodynamics* Otto Sackur, 1917 **Supplement to Mellor's Comprehensive Treatise on Inorganic and Theoretical Chemistry** Joseph William Mellor, 1922 **A Comprehensive Treatise on Inorganic and Theoretical Chemistry** Joseph William

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Fredeen, Pearson, 2003-07 **Chemical Principles with Qualitative Analysis** William L. Masterton, Emil J.
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