CORRELATION

ADVANCED PLACEMENT CHEMISTRY TOPICS

SUBJECT: AP Chemistry

TITLE: Chemistry, 8th Edition © 2005

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I. Structure of Matter (20%)	
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b. Relationships to states, structure, and properties of matter	436, 443-453, 462-471
c. Polarity of bonds, electronegativities	357-360

2. Molecular models
   a. Lewis structures — 346-372
   b. Valence bond: hybridization of orbitals, resonance, sigma and pi bonds — 365-367, 401-415
   c. VSEPR — 386-395

3. Geometry of molecules and ions, structural isomerism of simple organic molecules and coordination complexes; dipole moments of molecules; relation of properties to structure — 386-397, 437-446, 917-924, 981-985

C. Nuclear chemistry: nuclear equations, half-lives, and radioactivity; chemical applications — 548-554, Chapter 23

II. States of Matter (20%)

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C. Solutions	**Chapters 4, 12**
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3. Raoult's law and colligative properties (nonvolatile solutes); osmosis	499-514
4. Non-ideal behavior (qualitative aspects)	500-503

III. Reactions (35-40%)

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3. Oxidation-reduction reactions	126-127, 130-139, 148-150, 798-803
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c. Electrochemistry: electrolytic and galvanic cells; Faraday's laws; standard half-cell potentials; Nernst equation; prediction of the direction of redox reactions	801-815
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b. Equilibrium constants for reactions in solution	
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2. First law: change in enthalpy; heat of formation; heat of reaction; Hess's law; heats of vaporization and fusion; calorimetry	219-243, 464-470
3. Second law: entropy; free energy of formation, free energy of reaction; dependence of change in free energy on enthalpy and entropy changes	765-786
4. Relationship of change in free energy to equilibrium constants and electrode potentials	809-812
IV. Descriptive Chemistry (10-15%)	
1. Chemical reactivity and products of chemical reactions	118-139, 700-721
2. Relationships in the periodic table: horizontal, vertical, and diagonal with examples from alkali metals, alkaline earth metals, halogens, and the first series of transition elements	854-861, 912-916
3. Introduction to organic chemistry: hydrocarbons and functional groups (structure, nomenclature, chemical properties).	Chapter 24

V. Laboratory (5-10%) ***see laboratory manual to accompany <u>Chemistry</u>, 8th Edition, by Raymond Chang***

- making observations of chemical reactions and substances
- recording data
- calculating and interpreting results based on the quantitative data obtained
- communicating effectively the results of experimental work