

2018 AP Chemistry Summer Assignment

Suzanne.towner@yourcharlotteschools.net

This packet of information includes the course description for AP chemistry and the outline for the first unit. The outline includes five topics and there is an assignment to submit for each topic. Complete each assignment and either drop it off at school or mail it on or before the due date. If you drop it off at school, make sure to place it in an envelope and clearly write my name on the envelope. Hand it directly to a secretary and ask them to sign and date the envelope before placing it in my mailbox.

Mailing Address for Assignments:

Port Charlotte High School
ATTN: Ms. Towner
18200 Cochran Blvd.
Port Charlotte, FL 33948

Due Dates for Assignments:

Topic 1 Assignment: Thursday June 14
Topic 2 Assignment: Monday June 25
Topic 3 Assignment: Thursday July 5
Topic 4 Assignment: Monday July 16
Topic 5 Assignment: Thursday July 26

The following chart will give you an idea of the pace of the course.

| Day | Activities Planned |
|------------|---|
| 1 | Go over the course description, review lab rules, and test information Review the topic 1 assignment Chemical Equation Handbook Assignment, pages 1-8 |
| 2 | Review the topic 2 assignment Mass Spectroscopy (POGIL Model 1) |
| 3 | Mass Spectroscopy (POGIL Model 2) Solution Concentration Problem |
| 4 | Introduction to Colorimetry Pre-Lab: Analysis of Food Dyes in Beverages |
| 5 | LAB: Analysis of Food Dyes in Beverages |
| 6 | Review the topic 3 assignment Chemical Equation Handbook Assignment, pages 9-10 and 13-18 Work on the lab |
| 7 | Review the topic 4 assignment (part one) Work on the lab |
| 8 | Review the topic 4 assignment (part two) Photoelectron Spectroscopy (POGIL Models 1-2) |
| 9 | Photoelectron Spectroscopy (POGIL Models 3-5) HW: Periodic Trends Chart |
| 10 | Review the topic 5 assignment (part one) Mass Spectroscopy (POGIL Model 3) |
| 11 | Review the topic 5 assignment (part two) Review |
| 12 | Review |
| 13 | Unit One Test |

Extra Help:

- Monday-Thursday **after** school--please be aware that I am very busy before school and will send you away... don't be offended... don't procrastinate...

Overview of the Topics:

- Unit 1: Chemical Foundations
 - Topic 1: Measuring and Classifying Matter
 - Topic 2: Evidence of Atomic Structure
 - Topic 3: Patterns in Formulas and Reactivity
 - Topic 4: Electronic Structure of Atoms
 - Topic 5: Periodic Trends
- Unit 2: Stoichiometry and Reaction Types
 - Topic 6: Stoichiometry
 - Topic 7: Reactions in Solutions
 - Topic 8: Solution Stoichiometry
- Unit 3: Thermochemistry
 - Topic 9: Calculating Changes in Energy State
 - Topic 10: Calculating Changes in Entropy
 - Topic 11: Free Energy and Spontaneity
- Unit 4: Chemical Bonding
 - Topic 12: Bonding Basics
 - Topic 13: The Localized Electron Model of Covalent Bonding
- Unit 5: Gases
 - Topic 14: Gas Laws and Gas Stoichiometry
 - Topic 15: Kinetic-Molecular Theory
- Unit 6: Solids, Liquids, and Solutions
 - Topic 16: Phases of Matter
 - Topic 17: Phase Changes
 - Topic 18: Solutions
- Unit 7: Kinetics
 - Topic 19: What is Kinetics?
 - Topic 20: Reaction Mechanisms and Integrated Rate Laws
- Unit 8: Equilibrium
 - Topic 21: What is equilibrium?
 - Topic 22: Solving Equilibrium Problems
 - Topic 23: Equilibrium, Free Energy, and Nonstandard Conditions
- Unit 9: Applications of Aqueous Equilibria
 - Topic 24: Acid-Base Equilibria
 - Topic 25: Buffers and Titrations
 - Topic 26: Solubility and Complex Ion Equilibria
- Unit 10: Topic 27: Electrochemistry Basics

Unit One: Chemical Foundations

Topic 1: Measuring and Classifying Matter

Read pages 3-20, 26-28

Vocabulary to review: theory, model, law, precision, accuracy, significant digits, dimensional analysis, states, mixtures, homogeneous, heterogeneous, solution, distillation, filtration, chromatography

Make sure that you can:

- create and interpret particulate drawings for elements, compounds, and various mixtures
- identify the correct number of significant digits to keep after performing various calculations
- solve problems using dimensional analysis
- compare and contrast various methods for separating mixtures

TOPIC 1 ASSIGNMENT: *Make sure to explain your answers to questions thoroughly. Show all work (including sig. figs. and units) for problems.*

pages 32-34 #32, 35-36, 38-39, 50, 73, and 88

Topic 2: Evidence for Atomic Structure

Read pages 40-57, 77-87

Vocabulary to review: atomic mass, electron, radioactivity, proton, neutron, isotope, atomic number, mass number, covalent bond, molecule, ion, mass spectrometer, average atomic mass, mole, molar mass

Make sure that you can:

- justify the ratios of masses of elements in compounds or between compounds in terms of the laws of conservation of mass, constant composition (definite proportions), and multiple proportions
- write and interpret nuclear symbols for isotopes
- solve problems involving moles and average atomic masses for the isotopes of any element
- interpret mass spectrometry data

TOPIC 2 ASSIGNMENT: *Make sure to explain your answers to questions thoroughly. Show all work (including sig. figs. and units) for problems.*

pages 70-71 #28, 34, 36, 52 (a-c), and 60

pages 119-120 #34, 38, 44, and 60

Topic 3: Patterns in Formulas and Reactivity

Read pages 57-66, 97-102

Vocabulary to review: binary compound, ion, cation, anion, ionic compound, oxyanions, acids, chemical equation, reactants, products

Make sure that you can:

- write and interpret nuclear symbols for ions
- write names and formulas for ionic compounds, acids, and simple organic compounds
- balance equations to demonstrate the Law of Conservation of Mass

TOPIC 3 ASSIGNMENT:

pages 72-73 #70, 72, and 76

page 122 #94

Topic 4: Electronic Structure of Atoms

Read pages 285-291, 294-296, 303-309, 312-318

Vocabulary to review: electromagnetic radiation, wavelength, frequency, quantum, photons, photoelectric effect, continuous spectrum, line spectrum, quantum model, ground state, excited state, quantum numbers, electron configurations

Make sure that you can:

- explain how the energies of electrons within main energy levels vary using PES data, ionization energy data, and/or Coulomb's Law
- determine if a model for atomic structure is consistent with given information or if the data suggests that the model needs revision
- perform calculations involving the energy of a photon and the processes induced by a photon
- justify the absorption or emission of different forms of electromagnetic radiation as a measurement of either molecular vibration/bond type, functional group, or electron transition between energy levels
- write and interpret electron configurations and orbital notations for atoms and ions
- identify electron configurations for atoms or ions in an excited state

TOPIC 4 ASSIGNMENT: *Make sure to explain your answers to questions thoroughly. Show all work (including sig. figs. and units) for problems.*

pages 330-333 #24, 32, 38, 40, 46, 48, 68, and 80 (skip Tl and Bi)

Topic 5: Periodic Trends

Read pages 312-327

Vocabulary to review: valence electrons, lanthanides, actinides, main group elements, first ionization energy, second ionization energy, electron affinity, atomic radius, ionic radius, alkali metals, effective nuclear charge, alkali metals, alkaline earth metals, transition elements, halogens, noble gases, metals, nonmetals, metalloids

Make sure that you can:

- a. justify the arrangement of the periodic table
- b. predict and justify the periodic trends in atomic properties using concepts from atomic theory
- c. analyze data to identify patterns and generate hypothesis in order to predict the physical and chemical properties of elements and binary compounds based on periodic trends
- d. describe the general properties of metals, nonmetals, metalloids, alkali metals, alkaline earth metals, hydrogen, the oxygen group, the halogens, and the noble gases

TOPIC 5 ASSIGNMENT: *Make sure to explain your answers to questions thoroughly.*

pages 330-336 #26, 100, 104, and 106 (parts b-d)