**AP Chemistry Unit 10 Tentative Agenda** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Solutions

| **Date** | **Agenda** |
| --- | --- |
| Monday 2/10 | * Go over U9 Test. * Begin solutions notes. * Homework   + Reread Chapter 4.   + Read Chapter 13. |
| Tuesday 2/11 | * Finish Solutions Notes * Work sample problems * Homework   + Mastering 1-20 |
| Wednesday 2/12 | * Work sample problems. * Homework   + Mastering 21-40 |
| Thursday 2/13 | * You will do both labs. Begin one of the following:   + Lab A: Solution Conductivity   + Lab B: Determining the Concentration of Cobalt(II) Chloride Using Spectroscopy * Homework   + Mastering 41-60   + Prelab for at least one of the labs. |
| Friday 2/14 | * Continue:   + Lab A: Solution Conductivity   + Lab B: Determining the Concentration of Cobalt(II) Chloride Using Spectroscopy * Homework   + Mastering 61-85 |
| Tuesday 2/18 | * Chapter 13 quiz (Molarity of a solution by titration, adding solid, dilution) * Mastering Day/Finish Lab * Labs Due * Hint of the day: Review structure of the atom: how can you predict whether or not a metal ion will have color? * Homework   + Mastering 86-112 |
| Wednesday 2/19 | * Review * Hint of the day: Review Unit 9. I will include 5 questions from the KMT test on this test. * Homework   + Mastering Due 11:59 PM |
| Thursday 2/20 | * Unit 9 Test |
| Friday 2/21 | * Go over test * Begin Kinetics Unit |

**Learning Objectives:**

LO 1.15 The student can justify the selection of a particular type of spectroscopy to measure properties associated with vibrational or electronic motions of molecules. [See SP 4.1, 6.4]

LO 1.16 The student can design and/or interpret the results of an experiment regarding the absorption of light to determine the concentration of an absorbing species in a solution. [See SP 4.2, 5.1]

Essential knowledge 1.D.3: The interaction of electromagnetic waves or light with matter is a powerful means to probe the structure of atoms and molecules, and to measure their concentration.

a. The energy of a photon is related to the frequency of the electromagnetic wave through Planck’s equation (E = hν). When a photon is absorbed (or emitted) by a molecule, the energy of the molecule is increased (or decreased) by an amount equal to the energy of the photon.

b. Different types of molecular motion lead to absorption or emission of photons in different spectral regions. ***Infrared radiation is associated with transitions in molecular vibrations and so can be used to detect the presence of different types of bonds. Ultraviolet/visible radiation is associated with transitions in electronic energy levels and so can be used to probe electronic structure.***

c. The amount of light absorbed by a solution can be used to determine the concentration of the absorbing molecules in that solution, via the Beer-Lambert law.

LO 2.8 The student can draw and/or interpret representations of solutions that show the interactions between the solute and solvent. [See SP 1.1, 1.2, 6.4]

LO 2.9 The student is able to create or interpret representations that link the concept of molarity with particle views of solutions. [See SP 1.1, 1.4]

Essential knowledge 2.A.3: Solutions are homogenous mixtures in which the physical properties are dependent on the concentration of the solute and the strengths of all interactions among the particles of the solutes and solvent.

a. In a solution (homogeneous mixture), the macroscopic properties do not vary throughout the sample. This is in contrast to a heterogeneous mixture in which the macroscopic properties depend upon the location in the mixture. The distinction between heterogeneous and homogeneous depends on the length scale of interest. As an example, colloids may be heterogeneous on the scale of micrometers, but homogeneous on the scale of centimeters.

b. Solutions come in the form of solids, liquids, and gases.

c. For liquid solutions, the solute may be a gas, a liquid, or a solid.

d. Based on the reflections of their structure on the microscopic scale, liquid solutions exhibit several general properties:

1. The components cannot be separated by using filter paper.

2. There are no components large enough to scatter visible light.

3. The components can be separated using processes that are a result of the intermolecular interactions between and among the components.

e. Chromatography (paper and column) separates chemical species by taking advantage of the differential strength of intermolecular interactions between and among the components.

f. Distillation is used to separate chemical species by taking advantage of the differential strength of intermolecular interactions between and among the components and the effects these interactions have on the vapor pressures of the components in the mixture.

g. The formation of a solution may be an exothermic or endothermic process, depending on the relative strengths of intermolecular/interparticle interactions before and after the dissolution process.

h. Generally, when ionic compounds are dissolved in water, the component ions are separated and dispersed. The presence of ions in a solution can be detected by use of conductivity measurements.

i. Solution composition can be expressed in a variety of ways; molarity is the most common method used in the laboratory. Molarity is defined as the number of moles of solute per liter of solution.

j. Understanding how to prepare solutions of specified molarity through direct mixing of the components, through use of volumetric glassware, and by dilution of a solution of known molarity with additional solvent is important for performing laboratory work in chemistry.

✘✘ Colligative properties are beyond the scope of this course and the AP Exam and are therefore considered prior knowledge and not directly assessed on the exam.

✘✘ Calculations of molality, percent by mass, and percent by volume are beyond the scope of this course and the AP Exam. Rationale: Molality pertains to colligative properties, which are considered prior knowledge and therefore molality will not be assessed on the exam.

**Mastering Chemistry Assignment Breakdown**

| [**#**](http://session.masteringchemistry.com/myct/yui-dt0-href-ordinal) | [**TITLEShow Descriptions**](http://session.masteringchemistry.com/myct/yui-dt0-href-title) | **DIFFICULTY** | **MEDIAN TIME** |
| --- | --- | --- | --- |
| [**System**](http://session.masteringchemistry.com/myct/yui-dt0-href-systemDifficulty) | [**System**](http://session.masteringchemistry.com/myct/yui-dt0-href-formattedSystemTime) |
| 1 | [Solutions](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510584) | 2 | 4m |
| 2 | [Problem 4.2](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510568) | 1 | 1m |
| 3 | [Give It Some Thought: 4.1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510588) | 2 | 4m |
| 4 | [Problem 4.17](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510627) | 3 | 7m |
| 5 | [Chapter 4 Question 1 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510609) | 1 | <1m |
| 6 | [Chapter 4 Question 1 - Short Answer](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510610) | 1 | 1m |
| 7 | [Chapter 4 Question 2 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510628) | 1 | 1m |
| 8 | [Chapter 4 Question 1 - Algorithmic](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510591) | 3 | 2m |
| 9 | [Qualitative Analysis - Applying the Solubility Guidelines](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510578) | 5 | 13m |
| 10 | [Give It Some Thought: 4.3](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510617) | 2 | 2m |
| 11 | [Chapter 4 Question 16 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510633) | 2 | 1m |
| 12 | [Chapter 4 Question 16 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510580) | 2 | 2m |
| 13 | [Chapter 4 Question 17 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510581) | 2 | 1m |
| 14 | [Reactions in Solution](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510600) | 1 | 2m |
| 15 | [Chapter 4 Question 37 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510636) | 1 | 1m |
| 16 | [Chapter 4 Question 42 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510645) | 1 | 1m |
| 17 | [Chapter 4 Question 41 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510665) | 2 | 2m |
| 18 | [± Ion Concentration](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510648) | 2 | 12m |
| 19 | [± Concentration](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510649) | 5 | 17m |
| 20 | [Chapter 4 Question 40 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510668) | 1 | 1m |
| 21 | [Chapter 4 Question 10 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508524) | 1 | 1m |
| 22 | [Chapter 4 Question 10 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508489) | 2 | 1m |
| 23 | [Chapter 4 Question 12 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508490) | 1 | 1m |
| 24 | [Chapter 4 Question 12 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508525) | 2 | 1m |
| 25 | [Problem 4.39](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508505) | 2 | 24m |
| 26 | [Problem 4.44](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508492) | 3 | 13m |
| 27 | [Give It Some Thought: 4.9](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508500) | 1 | 1m |
| 28 | [Problem 4.69](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508521) | 1 | 2m |
| 29 | [Problem 4.64](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508501) | 3 | 5m |
| 30 | [Problem 4.68](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508571) | 2 | 11m |
| 31 | [Problem 4.77](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508604) | 3 | 5m |
| 32 | [Problem 4.74](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508557) | 2 | 7m |
| 33 | [Chapter 4 Question 54 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508576) | 1 | 1m |
| 34 | [Chapter 4 Question 53 - Multiple Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508559) | 1 | 2m |
| 35 | [Problem 4.90](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508593) | 2 | 4m |
| 36 | [Solution Formation](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508627) | 2 | 3m |
| 37 | [± Energetics of Solution Formation](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508596) | 1 | 6m |
| 38 | [± Hydrates](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508608) | 3 | 9m |
| 39 | [Interactive Activity—Dissolution of an Ionic Solid](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508630) | 4 | 9m |
| 40 | [Interactive Activity—Energetics of Solution Formation](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508599) | 2 | 7m |
| 41 | [Animation—Dissolution of NaCl in water](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508662) | 3 | 11m |
| 42 | [Problem 13.1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508634) | 1 | 1m |
| 43 | [Problem 13.16](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508645) | 1 | 4m |
| 44 | [Give It Some Thought: 13.1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508614) | 2 | 1m |
| 45 | [Give It Some Thought: 13.3](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508647) | 1 | 1m |
| 46 | [Go Figure 13.4](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508649) | 1 | 1m |
| 47 | [Problem 13.15](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508650) | 1 | 2m |
| 48 | [Problem 13.17](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508651) | 1 | 1m |
| 49 | [Problem 13.18](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508667) | 1 | 1m |
| 50 | [Problem 13.19](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508616) | 3 | 2m |
| 51 | [Go Figure 13.2](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508652) | 1 | 3m |
| 52 | [Problem 13.3](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508656) | 1 | 3m |
| 53 | [Chapter 13 Question 2 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508676) | 1 | 1m |
| 54 | [Chapter 13 Question 5 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508705) | 1 | 1m |
| 55 | [Chapter 13 Question 6 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508681) | 1 | 1m |
| 56 | [Chapter 13 Question 8 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508706) | 1 | 1m |
| 57 | [Go Figure 13.8](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508696) | 3 | 3m |
| 58 | [Chapter 13 Reading Quiz Question 3](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508712) | 2 | 1m |
| 59 | [Chapter 13 Question 1 - Short Answer](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508728) | 1 | 2m |
| 60 | [Chapter 13 Question 10 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508714) | 1 | 1m |
| 61 | [Chapter 13 Question 11 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508715) | 1 | 1m |
| 62 | [Chapter 13 Question 12 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508700) | 1 | 1m |
| 63 | [Chapter 13 Question 13 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508751) | 1 | <1m |
| 64 | [Chapter 13 Question 14 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508701) | 1 | <1m |
| 65 | [Chapter 13 Question 15 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508730) | 1 | <1m |
| 66 | [Basics of Solution Formation](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508788) | 4 | 15m |
| 67 | [Hydrophobic versus Hydrophilic](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508790) | 3 | 3m |
| 68 | [± Energy Changes and the Solution Process](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508798) | 4 | 13m |
| 69 | [Solubility and Temperature](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508892) | 4 | 11m |
| 70 | [± Solubility of Gases and Intermolecular Forces](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33508896) | 3 | 15m |
| 71 | [Give It Some Thought: 13.5](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33509184) | 1 | 1m |
| 72 | [Go Figure 13.14](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33509269) | 1 | 1m |
| 73 | [Go Figure 13.19](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33509306) | 2 | 1m |
| 74 | [Problem 13.32](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33509277) | 3 | 3m |
| 75 | [Chapter 13 Reading Quiz Question 4](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33509402) | 2 | 1m |
| 76 | [Chapter 13 Question 16 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33509381) | 1 | 1m |
| 77 | [Chapter 13 Question 18 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510102) | 1 | 1m |
| 78 | [Chapter 13 Question 20 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510298) | 2 | 1m |
| 79 | [Chapter 13 Question 22 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510120) | 1 | <1m |
| 80 | [Chapter 13 Question 24 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510299) | 2 | 1m |
| 81 | [Chapter 13 Question 25 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510322) | 1 | <1m |
| 82 | [Chapter 13 Question 32 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510075) | 1 | <1m |
| 83 | [± Convert between Units of Concentration](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510076) | 2 | 15m |
| 84 | [Chapter 13 Reading Quiz Question 1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510416) | 1 | 1m |
| 85 | [Chapter 13 Reading Quiz Question 2](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510438) | 3 | 3m |
| 86 | [Chapter 13 Question 1 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510440) | 1 | 1m |
| 87 | [Chapter 13 Question 1 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510455) | 2 | 1m |
| 88 | [Chapter 13 Question 3 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510417) | 1 | 1m |
| 89 | [Chapter 13 Question 4 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510470) | 1 | 1m |
| 90 | [Chapter 13 Question 7 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510472) | 2 | 2m |
| 91 | [Chapter 13 Question 9 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510419) | 2 | 2m |
| 92 | [Chapter 13 Question 2 - Short Answer](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510487) | 2 | 1m |
| 93 | [Chapter 13 Question 2 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510479) | 1 | <1m |
| 94 | [Aqueous Reactions](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510629) | 5 | 14m |
| 95 | [Chapter 13 Question 1 - True/False](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510488) | 1 | <1m |
| 96 | [Chapter 13 Question 4 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510510) | 2 | 1m |
| 97 | [Chapter 13 Question 7 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510523) | 1 | 1m |
| 98 | [Chapter 13 Question 21 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510491) | 3 | 1m |
| 99 | [Chapter 13 Question 19 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510543) | 4 | 1m |
| 100 | [Chapter 13 Question 23 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510544) | 2 | <1m |
| 101 | [Chapter 13 Question 27 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510526) | 1 | <1m |
| 102 | [Chapter 13 Question 26 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510493) | 1 | <1m |
| 103 | [Chapter 13 Question 33 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510546) | 2 | 1m |
| 104 | [Chapter 13 Question 34 - Multiple-Choice](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510547) | 1 | 1m |
| 105 | [Solubility](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510529) | 3 | 14m |
| 106 | [± Introduction to Units of Concentration](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510498) | 2 | 12m |
| 107 | [Give It Some Thought: 13.7](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510550) | 2 | 5m |
| 108 | [Chapter 4 Question 47 - Bimodal](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510705) | 2 | 1m |
| 109 | [Problem 13.55](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510500) | 2 | 4m |
| 110 | [Problem 13.62](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510520) | 1 | 2m |
| 111 | [Chapter 4 Question 16 - Algorithmic](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510653) | 5 | 2m |
| 112 | [Give It Some Thought: 13.12](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=33510564) | 1 | 1m |
|  | | **Average:**    **1.8** | **Total:**    **391m** |
| **112 items (109.00 points)** | |