**Honors Chemistry II Unit 5 Tentative Agenda** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Organic Chemistry

| **Date** | **Agenda** |
| --- | --- |
| Wednesday, 11/6 | * CH 24 Notes * HW: Read for understanding - Chapter 24, 12.8, and 12.9 |
| Thursday, 11/7 | * CH 24 Notes * HW:   + Mastering Chemistry (Start) |
| Friday, 11/8 | * Finish CH 24 Notes * 12.8 & 12.9 Notes * HW:   + Mastering Chemistry (You should now be able to complete all problems.) |
| Tuesday, 11/12 | * Quiz CH 24, 12.8, 12.9 * Labs: Synthesis of an Ester & Separating a Synthetic Pain Relief Mixture * Hint of the day: Review reaction types (predicting products). |
| Wednesday, 11/13 | * Labs: Synthesis of an Ester & Separating a Synthetic Pain Relief Mixture * Hint of the day: Review entropy from honors chemistry. |
| Thursday, 11/14 | * Labs: Synthesis of an Ester & Separating a Synthetic Pain Relief Mixture * Hint of the day: Review how to calculate percent abundance of an isotope. |
| Friday, 11/15 | * Labs: Synthesis of an Ester & Separating a Synthetic Pain Relief Mixture * Hint of the day: Review wavelength calculations from Unit 2. |
| Monday, 11/18 | * Mastering Chemistry and/or finish lab day. * Hint of the day: Review PES |
| Tuesday, 11/19 | * Unit 5 Review * Hint of the day: Review IMF & Bonding Unit 4 (This is highly related to organic chemistry) * Mastering Chemistry due at 11:59PM |
| Wednesday, 11/20 | * Unit 5 Test |
| Friday, 11/22 | * Go over test. |

**Spectroscopy**

LO1.15 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]

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.

**Separations Labs**

LO 2.10 The student can design and/or interpret the results of a separation experiment (filtration, paper chromatography, column chromatography, or distillation) in terms of the relative strength of interactions among and between the components. [See SP 4.2, 5.1, 6.4]

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.

LO 2.11 The student is able to explain the trends in properties and/or predict properties of samples consisting of particles with no permanent dipole on the basis of London dispersion forces. [See SP 6.2, 6.4]

Essential knowledge 2.B.1: London dispersion forces are attractive forces present between all atoms and molecules. London dispersion forces are often the strongest net intermolecular force between large molecules.

a. A temporary, instantaneous dipole may be created by an uneven distribution of electrons around the nucleus (nuclei) of an atom (molecule).

b. London dispersion forces arise due to the Coulombic interaction of the temporary dipole with the electron distribution in neighboring atoms and molecules.

c. Dispersion forces increase with contact area between molecules and with increasing polarizability of the molecules. The polarizability of a molecule increases with the number of electrons in the molecule, and is enhanced by the presence of pi bonding.

LO 3.3 The student is able to use stoichiometric calculations to predict the results of performing a reaction in the laboratory and/or to analyze deviations from the expected results. [See SP 2.2, 5.1]

Essential knowledge 3.A.2: Quantitative information can be derived from stoichiometric calculations that utilize the mole ratios from the balanced chemical equations. The role of stoichiometry in real-world applications is important to note, so that it does not seem to be simply an exercise done only by chemists.

a. Coefficients of balanced chemical equations contain information regarding the proportionality of the amounts of substances involved in the reaction. These values can be used in chemical calculations that apply the mole concept; the most important place for this type of quantitative exercise is the laboratory.

1. Calculate amount of product expected to be produced in a laboratory experiment.

2. Identify limiting and excess reactant; calculate percent and theoretical yield for a given laboratory experiment.

b. The use of stoichiometry with gases also has the potential for laboratory experimentation, particularly with respect to the experimental determination of molar mass of a gas.

c. Solution chemistry provides an additional avenue for laboratory calculations of stoichiometry, including titrations.

**Functional Groups and Polymers**

LO 5.11 The student is able to identify the noncovalent interactions within and between large molecules, and/or connect the shape and function of the large molecule to the presence and magnitude of these interactions. [See SP 7.2]

Essential knowledge 5.D.3: Noncovalent and intermolecular interactions play important roles in many biological and polymer systems.

a. In large biomolecules, noncovalent interactions may occur between different molecules or between different regions of the same large biomolecule.

b. The functionality and properties of molecules depend strongly on the shape of the molecule, which is largely dictated by noncovalent interactions. For example, the function of enzymes is dictated by their structure, and properties of synthetic

polymers are modified by manipulating their chemical composition and structure.

| [**#**](http://session.masteringchemistry.com/myct/yui-dt0-href-ordinal) | [**TITLEShow Descriptions**](http://session.masteringchemistry.com/myct/yui-dt0-href-title) | | **DIFFICULTY** | | **MEDIAN TIME** | |
| --- | --- | --- | --- | --- | --- | --- |
| [**This Course**](http://session.masteringchemistry.com/myct/yui-dt0-href-courseDifficulty) | [**System**](http://session.masteringchemistry.com/myct/yui-dt0-href-systemDifficulty) | [**This Course**](http://session.masteringchemistry.com/myct/yui-dt0-href-formattedCourseTime) | [**System**](http://session.masteringchemistry.com/myct/yui-dt0-href-formattedSystemTime) |
| 1 | [Physical Properties of Polymers](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355393) | | -- | 4 | -- | 26m |
| 2 | [± Nanomaterials](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355397) | | -- | 4 | -- | 11m |
| 3 | [Give It Some Thought: 24.1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355427) | | -- | 1 | -- | <1m |
| 4 | [Go Figure 24.1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355443) | | -- | 1 | -- | 1m |
| 5 | [Go Figure 24.2](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355466) | | -- | 1 | -- | 1m |
| 6 | [Chapter 24 Reading Quiz Question 1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355484) | | -- | 1 | -- | 1m |
| 7 | [Introduction to Alkane Structures](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355476) | | -- | 3 | -- | 15m |
| 8 | [Introduction to Isomers](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355503) | | -- | 2 | -- | 13m |
| 9 | [Alkanes](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355461) | | -- | 3 | -- | 11m |
| 10 | [±Octane Rating](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355722) | | -- | 2 | -- | 4m |
| 11 | [Give It Some Thought: 24.2](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355742) | | -- | 1 | -- | 1m |
| 12 | [Go Figure 24.5](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355763) | | -- | 2 | -- | 2m |
| 13 | [Problem 24.1](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355751) | | -- | 1 | -- | 3m |
| 14 | [Problem 24.7](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355731) | | -- | 1 | -- | 2m |
| 15 | [Problem 24.8](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355734) | | -- | 1 | -- | 2m |
| 16 | [Problem 24.9](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355737) | | -- | 1 | -- | 5m |
| 17 | [Problem 24.10](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355790) | | -- | 2 | -- | 3m |
| 18 | [Problem 24.14](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355791) | | -- | 3 | -- | 4m |
| 19 | [Problem 24.16](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355798) | | -- | 2 | -- | 19m |
| 20 | [Chapter 24 Reading Quiz Question 2](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355854) | | -- | 1 | -- | <1m |
| 21 | [Chapter 24 Reading Quiz Question 3](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30355855) | | -- | 2 | -- | 1m |
| 22 | [Addition Reactions of Alkenes and Alkynes](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500871) | | -- | 2 | -- | 8m |
| 23 | [Functional Groups](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500882) | | -- | 1 | -- | 2m |
| 24 | [Organic Nomenclature](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500755) | | -- | 3 | -- | 10m |
| 25 | [Chirality](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500907) | | -- | 3 | -- | 11m |
| 26 | [Pause and Predict Video Quiz: Stereoisomers](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500909) | | -- | 2 | -- | 9m |
| 27 | [Give It Some Thought: 24.7](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500893) | | -- | 1 | -- | <1m |
| 28 | [Ionic versus Molecular Compounds](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500952) | | -- | 1 | -- | 1m |
| 29 | [Go Figure 12.29](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500931) | | -- | 1 | -- | 1m |
| 30 | [Introduction to Band Theory](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500898) | | -- | 1 | -- | 5m |
| 31 | [Attractive Forces within Solids](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500954) | | -- | 2 | -- | 2m |
| 32 | [Melting Point](http://session.masteringchemistry.com/myct/itemView?showStatsForCourse=1110976&view=solution&showStats=1&assignmentProblemID=30500955) | | -- | 1 | -- | 1m |
| **Total:** | |  |
| **--** | | **175m** |