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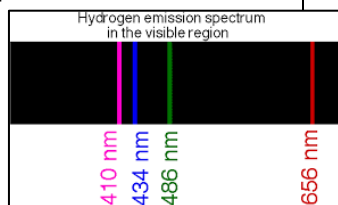
Seat#:

**Directions:** Any worksheet that is labeled with an \* means it is suggested extra practice. We do not always have time to assign every possible worksheet that would be good practice for you to do. You can do this worksheet when you have extra time, when you finish something early, or to help you study for a quiz or a test. If and when you choose to do this Extra Practice worksheet, please do the work on binder paper. You will include this paper stapled into your Rainbow Packet when you turn it in, even if you didn't do any of this. We want to make sure we keep it where it belongs so you can do it later if you want to (or need to). If you did the work on binder paper you can include that in your Rainbow Packet after this worksheet. If we end up with extra class time then portions of this may turn into required work. If that happens you will be told which problems are turned into required. Remember there is tons of other extra practice on the class website...and the entire internet! See me if you need help finding practice on a topic you are struggling with.

*“Natural science does not simply describe and explain nature, it is a part of the interplay between nature and ourselves.”*

*Werner Heisenberg (1901 - 1976)*

- 1) Calculate the wavelength of electromagnetic radiation that has a frequency of
  - a. 5.56 MHz. 53.9 m
  - b. 667nm. 4.49E<sup>14</sup> s<sup>-1</sup>
- 2) Electromagnetic radiation at the blue end of the visible spectrum has a wavelength of 400 nm. Calculate:
  - a. The frequency of the radiation. 7.50E<sup>14</sup> s<sup>-1</sup>
  - b. The energy of one photon of the radiation. 4.97E<sup>-19</sup> J
  - c. The energy of one mole of photons of this radiation. 299 KJ/mol



- 3) Examine the emission spectrum for hydrogen.
  - a. How many lines appear in the visible region? (Remember the Balmer series are the ones in the visible range.)
  - b. Why are there so few visible lines?
- 4) Calculate the frequency of the line in the hydrogen spectrum corresponding to the electron transition from n=9 to n=8. Whereabouts in the electromagnetic spectrum does this line occur? 1.08E<sup>13</sup> s<sup>-1</sup>
- 5) The ionization energy of an element is the energy required to remove the most loosely held electron from atoms of the element in the gaseous state. It is usually expressed in units of kJ/mol. Calculate from these data the ionization energy of hydrogen in kJ/mol  
Given that: 1.31E<sup>3</sup> J/mol
  - R, the Rydberg constant, is  $1.097 \times 10^7 \text{ m}^{-1}$
  - h, Planck's constant, is  $6.626 \times 10^{-34} \text{ J s}$
  - c, the speed of light, is  $2.998 \times 10^8 \text{ m s}^{-1}$

- 6) Consider doing some of the Honors Chem worksheets! (You would be surprised how many AP Chem students miss points on exams for Honors level questions and not even the AP level questions! You will hear me all year long saying "don't lose points in AP Chem for Honors level material!")  
[www.mychemistryclass.net/HCrainbowpacket2NEW.html](http://www.mychemistryclass.net/HCrainbowpacket2NEW.html)  
<https://mychemistryclass.net/HCrainbowpacket3.html>

- 7) Don't forget that our school has free peer tutoring available through the Academic Leadership class! The links are on the top of my Class Calendar.



- 8) Read, take notes, try some problems from your Tro online Textbook. (Remember that the textbook often covers more material than we need for this class. If it isn't something I talked about in my lectures/handouts/ worksheets, then you can skip it! I won't officially assign reading or problems from the textbook because it isn't a very efficient way to teach this class, but some students might need to read the textbook sections, or do extra practice in order for things to "click" differently for them. That is ok! Not everyone is going to need the same amount or type of studying. A lot of this class is figuring out what you personally need to do in order to feel successful. You will have access to the textbook all year, don't forget about it!)

Chapter 2: Atoms and Elements

Chapter 7: The Quantum Mechanical Model

Chapter 8: Periodic Properties of the Elements

[mlm.pearson.com/northamerica/masteringchemistry/](http://mlm.pearson.com/northamerica/masteringchemistry/)



- 9) Don't forget that there is extra practice on the class website too! AP Chem Tab → Study Materials Link → Scroll to the chapter we are on → Extra Study Materials Link. (I don't always have answer keys for the extra materials. If there is one, it will be in the folder!)
- 10) Don't forget that there is extra practice on GoFormative too! [www.goformative.com](http://www.goformative.com)  
(Another teacher made some assignments on GoFormative the year the school was Remote due to Covid. I have not proofread all the remote assignments, but I have published them so they are available for you to try if you would like!)
- 11) Don't forget that there is extra practice on AP Classroom too! <https://myap.collegeboard.org>  
(AP Classroom is a bit clunky, doesn't allow me to easily post questions in the order we go, sometimes crashes, still has old material we no longer cover, etc. BUT it is a source of questions that we know came from College Board! You can use the "tags" I made to pull up practice that is just on the chapter you are interested in studying.)
- 12) ScienceGeek.net has some good online practice tests. I haven't checked all of them, but the ones I have checked are pretty good!  
<https://www.sciencegeek.net/APchemistry/APtaters/directory.shtml>
- 13) Don't forget that you can sign up for my Access periods! You must sign up by Tuesday 8am of the week you want to attend. The links are on the front page of my class website and at the top of my Class Calendar.