

Name:

Period:

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.

**1982 D**

- (a) Draw the Lewis electron-dot structures for  $\text{CO}_3^{2-}$ ,  $\text{CO}_2$ , and  $\text{CO}$ , including resonance structures where appropriate.
- (b) Which of the three species has the shortest C-O bond length? Explain the reason for your answer.
- (c) Predict the molecular shapes for the three species. Explain how you arrived at your predictions.

**1990 D**

Use simple structure and bonding models to account for each of the following.

- (a) The bond length between the two carbon atoms is shorter in  $\text{C}_2\text{H}_4$  than in  $\text{C}_2\text{H}_6$ .
- (b) The H-N-H bond angle is  $107.5^\circ$ , in  $\text{NH}_3$ .
- (c) The bond lengths in  $\text{SO}_3$  are all identical and are shorter than a sulfur-oxygen single bond.
- (d) The  $\text{I}_3^-$  ion is linear.

**1992 D**



Nitrogen is the central atom in each of the species given above.

- (a) Draw the Lewis electron-dot structure for each of the three species.
- (b) List the species in order of increasing bond angle. Justify your answer.
- (c) Select one of the species and give the hybridization of the nitrogen atom in it.
- (d) Identify the only one of the species that dimerizes and explain what causes it to do so.

**1996 D**

Explain each of the following observations in terms of the electronic structure and/or bonding of the compounds involved.

- (b) Molecules of  $\text{AsF}_3$  are polar, whereas molecules of  $\text{AsF}_5$  are nonpolar.
- (c) The N-O bonds in the  $\text{NO}_2^-$  ion are equal in length, whereas they are unequal in  $\text{HNO}_2$ .
- (d) For sulfur, the fluorides  $\text{SF}_2$ ,  $\text{SF}_4$ , and  $\text{SF}_6$  are known to exist, whereas for oxygen only  $\text{OF}_2$  is known to exist.

**1997 D**

Consider the molecules  $\text{PF}_3$  and  $\text{PF}_5$ .

- (a) Draw the Lewis electron-dot structures for  $\text{PF}_3$  and  $\text{PF}_5$  and predict the molecular geometry of each.
- (b) Is the  $\text{PF}_3$  molecule polar, or is it nonpolar? Explain.
- (c) On the basis of bonding principles, predict whether each of the following compounds exists. In each case, explain your prediction.
- (i)  $\text{NF}_5$
- (ii)  $\text{AsF}_5$

This is related to Coulomb's Law, so wait to look at this PowerPoint until you have covered this topic in class.

This is a short presentation that was shown at a teacher workshop that I thought had some good quick reminders.



<https://tinyurl.com/3scujrb8>



## Dougherty Valley HS Chemistry - AP Bonding – Extra Practice FRQs

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**EVEN MORE PRACTICE! Hard work now during the chapter will set you up for success and save you time long term! Make smart, mature choices!**

- 1) 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!”)*  
<https://mychemistryclass.net/HCrainbowpacket5.html>
- 2) 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 3: Molecules, Compounds & Chemical Equations  
Chapter 9: Chemical Bonding I: The Lewis Model  
Chapter 10: Chemical Bonding II: Molecular Shapes, Valence Bond Theory, and Molecular Orbital Theory  
[mlm.pearson.com/northamerica/masteringchemistry/](http://mlm.pearson.com/northamerica/masteringchemistry/)
- 3) 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!)*
- 4) 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!)*
- 5) 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.)*
- 6) 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>
- 7) 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.
- 8) 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.