

Name: _____

Date: _____

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

- Draw the Lewis electron-dot structures for CO_3^{2-} , CO_2 , and CO , including resonance structures where appropriate.
- Which of the three species has the shortest C-O bond length? Explain the reason for your answer.
- Predict the molecular shapes for the three species. Explain how you arrived at your predictions.

1990 D (Required)

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

- The bond length between the two carbon atoms is shorter in C_2H_4 than in C_2H_6 .
- The H-N-H bond angle is 107.5° , in NH_3 .
- The bond lengths in SO_3 are all identical and are shorter than a sulfur-oxygen single bond.
- The I_3^- ion is linear.

1992 D



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

- Draw the Lewis electron-dot structure for each of the three species.
- List the species in order of increasing bond angle. Justify your answer.
- Select one of the species and give the hybridization of the nitrogen atom in it.
- 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.

- Molecules of AsF_3 are polar, whereas molecules of AsF_5 are nonpolar.
- The N-O bonds in the NO_2^- ion are equal in length, whereas they are unequal in HNO_2 .
- For sulfur, the fluorides SF_2 , SF_4 , and SF_6 are known to exist, whereas for oxygen only OF_2 is known to exist.

1997 D (Required)

Consider the molecules PF_3 and PF_5 .

- Draw the Lewis electron-dot structures for PF_3 and PF_5 and predict the molecular geometry of each.
- Is the PF_3 molecule polar, or is it nonpolar? Explain.
- On the basis of bonding principles, predict whether each of the following compounds exists. In each case, explain your prediction.
 - NF_5
 - AsF_5