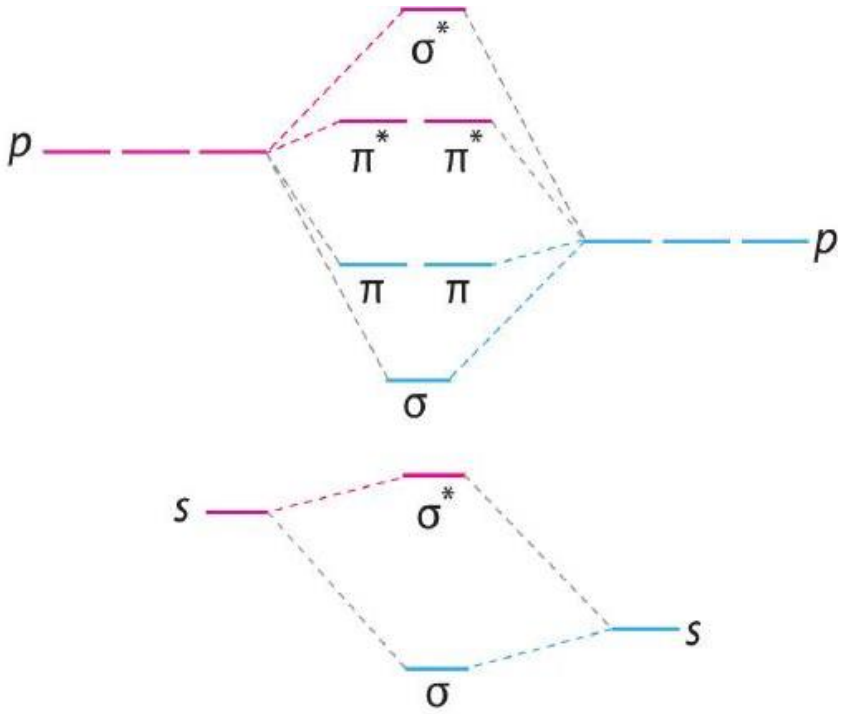
3.091 Introduction to Solid State Chemistry
Fall Term 2018
Quiz 5 (A)
10/18/2018

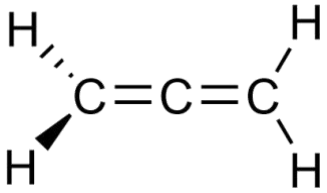
Do yourself a solid.

1. Consider the molecule OBr^-.
   a. Fill in the MO diagram for the molecule using arrow notation. Label each atomic orbital side with the correct atom. (2 pts)



   b. What is the bond order? (1 pt)

2. Allene is a compound with formula C_3H_4 with the following Lewis dot structure:



   a. Give the hybridization for all the carbons in the allene. (1 pt)

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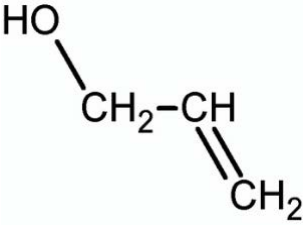
b. Label the individual bonds as sigma or pi bonds. (1 pt)

c. List the intermolecular interactions that could happen between only an allene and an allyl alcohol molecule. Allyl has the following structure: (1 pt)



d. Rank the following in order of ascending boiling point: pure allene, a mixture of allene and allyl alcohol, and pure allyl alcohol. (1 pt)

3. Given the visible spectrum below, answer the following questions.

The visible spectrum in nanometers

Violet	Blue	Cyan	Green	Yellow	Orange	Red
400	450	500	550	600	650	700

a. If you shine a violet light onto a red small LED, how much heat energy will a promoted electron in the red small LED dissipate? (2 pts)

b. Rank the amount of heat energy dissipated in the mystery LED, a red LED, and a blue LED if you were to shine a violet light onto them. (Hint: use your GB to help LEaD you to the answer) (1 pt)

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