

HW09 - VB

Question 1

3 pts

Which of the following combinations of hybridization and molecular geometry is possible?

- sp^2 , linear
- sp^2 , tetrahedral
- sp^3d , octahedral
- sp^3 , trigonal pyramidal

Question 2

3 pts

The sp^3 hybridization has what percent s character and what percent p character respectively?

- 25%, 75%
- 50%, 50%
- 75%, 25%
- 33%, 67%

Question 3

3 pts

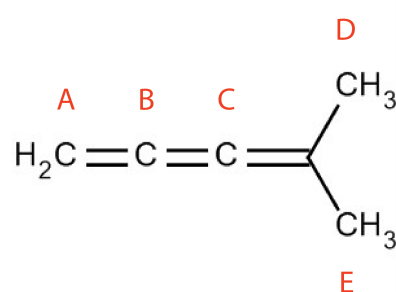
What hybridization would you expect for Se when it is found in SeO_4^{2-} ?

- sp^3d^2
- sp^3d
- sp^3
- sp^2

Question 4

4 pts

Give the hybridization of each central atom in order from A to E:



- sp^2 , sp, sp, sp^2 , sp^2
- sp^3 , sp^2 , sp^2 , sp^3 , sp^3
- sp^3 , sp, sp, sp^3 , sp^3
- sp^2 , sp, sp, sp^3 , sp^3

Question 5

4 pts

What hybridization would you expect for C in ethyne (C_2H_2)?

- sp^2
- sp^3
- sp^3d
- sp

Question 6

3 pts

sp^2 hybrid orbitals have...

- tetrahedral symmetry.
- linear symmetry.
- trigonal planar symmetry.
- trigonal pyramidal symmetry.

Question 7

3 pts

A sigma bond...

- may exist alone or in conjunction with a pi bond.
- is composed of non-bonding orbitals.
- always exists in conjunction with a pi bond.
- is always polar.
- stems from sp hybridization of orbitals.

Question 8

3 pts

In a new compound, it is found that the central carbon atom is sp^2 hybridized. This implies that...

- carbon has four regions of high electron density.
- carbon is also involved in a pi bond.
- carbon has four lone pairs of electrons.
- carbon has four sigma bonds.
- carbon has a tetrahedral electronic geometry.

Question 9

4 pts

In the molecule, C_2H_4 , what are the atomic orbitals that participate in forming the sigma bond between the C and H atoms?

- H: sp^2 , C: sp^2
- H: 2p, C: sp^3
- H: 1s, C: sp
- H: 1s, C: 2p
- H: 1s, C: sp^2