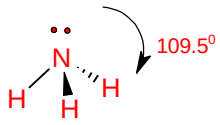
Name _____Mr. Perfect_____ Date _____F 11_____

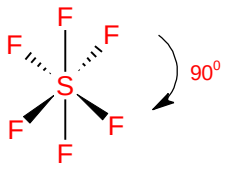
1. Give the expected bond angles and predict the hybrid orbitals expected for the following compounds: (4 pts)

a) NH_3



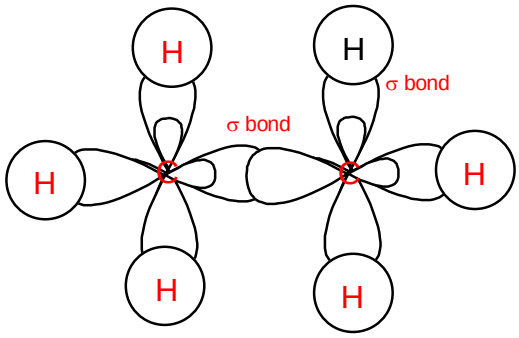
sp^3

b) SF_6



sp^3d^2

2. Draw C_2H_6 showing the hybrid orbitals of carbon involved in bonding. Show all of the σ and π bonds expected in the molecule. What is the hybridazation of each carbon atom in this molecule? (4 pts)



Each carbon atom is a sp^3 hybrid orbital. All bonds are sigma bonds.

3. Use partial orbital diagrams (Valence Bond Theory) to show how the atomic orbitals of the central atom leads to hybridization for the following molecules: (2 pts)

a) $SeCl_2$

Se atom

6 valence electrons

[↑↓] [↑↓][↑][↑] ground-state

4s 4p

↓

[↑↓][↑↓][↑][↑] hybridization

sp^3

b) H_3O^+

O atom

5 valence electrons (+ charge subtract 1)

[↑↓] [↑][↑][↑]

2s 2p

↓

[↑↓][↑][↑][↑]

sp^3