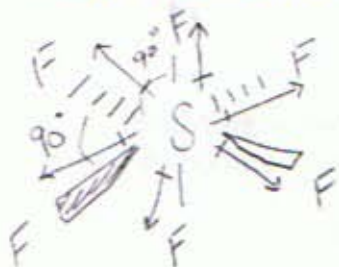


Name: _____

4 I. (10 points)

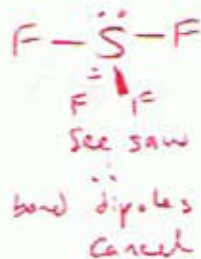
Sulfur hexafluoride is nonpolar (dipole moment = 0) and sulfur tetrafluoride is polar (dipole moment = 0.63D). Explain these observations using VSEPR. (Note: a full answer includes drawings of the molecules in three dimensional perspective, i.e., using wedges and dashed lines.)



octahedral
all dipole moment is canceled



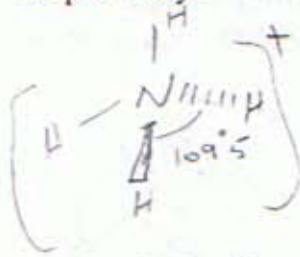
~~square planar.~~
the two lone pair electrons are responsible for the dipole moment.



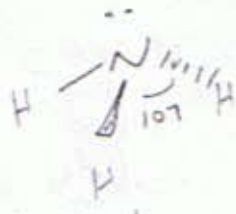
II. (6 points each, 12 points total)

Use VSEPR to explain the following observations.

a. The bond angles of NH_4^+ , NH_3 , and NH_2^- are 109.5° , 107° , and 105° , respectively.



tetrahedral.



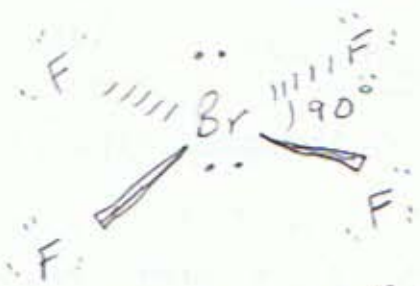
trigonal pyramid



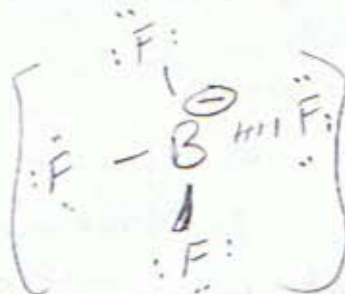
bent

Electron domain for NH_4^+ is tetrahedral as it loses the H^+ & lone pair of electrons. will be on the N, they take more space reducing angles between H 's to 107° as shown in trigonal pyramid and again losing the next H^+ to have two ~~double bond~~ lone pairs on the N will reduce the angles more to 105° (bent).

b. The anion BrF_4^- is square planar whereas BF_4^- is tetrahedral.



lone pair are as far apart as possible (180°) the H-F 's are in a square planar 90° angle between F 's



no lone pairs, 4 atoms attached to B which has valence 3 valence electrons, after bonding B will have FC of -1
angles between the fluorines are 109.5°