

For 10/14/09

Chemistry 121

WORK IN CLASS "Molecular geometry"

Which of the following molecules can be expected to have a ZERO dipole moment on the basis of their molecular geometry:

1. GeF_4

2. SF_2

3. XeF_2

4. AsF_3

A. 1

B. 1 and 2

C. 1, 2, 3

D. 1, 3

E. 3, 2

Follow the steps:

1. Lewis structure (total valence e count \rightarrow try all octet \rightarrow check # of e used \rightarrow if used too much – try multiple bonds; if didn't use enough - put extra lone pairs on central atom)
2. Count total # of e clouds \rightarrow sketch overall geometry
3. Look at atoms only \rightarrow determine MOLECULAR geometry
4. Look at and mark the polarity of each bond in the molecule and decide on OVERALL MOLECULAR DIPOLE (zero or not, and if not – dipole direction).

step	GeF_4	SF_2	XeF_2	AsF_3
1				
2				
3				
4				

Question I gives an **outline of the steps** you should take every time when asked about molecular geometry-related questions (such as hybridization, dipole, etc) . Follow these steps!

II. Which of these polyatomic molecules could be of bent molecular geometry?

(Follow steps in the question I above!)

A. CO_2

B. HCN

C. SO_2

D. BeH_2

Determine bond angles for ALL atoms of this bent geometry molecule:

III. Which of the following molecules has polar bonds AND overall dipole moment?

(Follow steps in the question I above!)

A. CCl_4

B. NF_3

C. SF_6

D. BF_3