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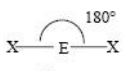
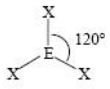
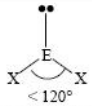
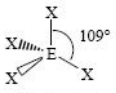
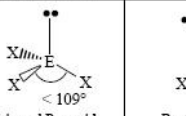
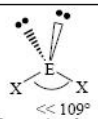
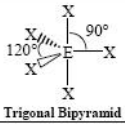
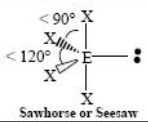
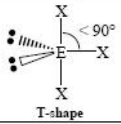
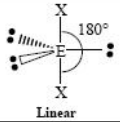
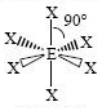
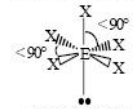
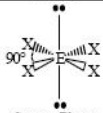
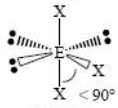
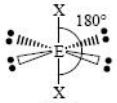
9/10/2013
Office Hour: Tu 5-6pm Location: Bixby Common

Chem 4A Scholars Worksheet 3

Lewis Structure, VSEPR Theory and resonance structures

VSEPR Table:

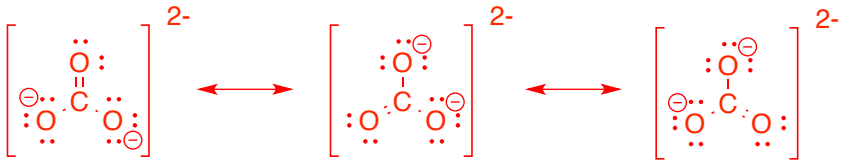
VSEPR Geometries					
Steric No.	Basic Geometry 0 lone pair	1 lone pair	2 lone pairs	3 lone pairs	4 lone pairs
2	 Linear				
3	 Trigonal Planar	 Bent or Angular			
4	 Tetrahedral	 Trigonal Pyramid	 Bent or Angular		
5	 Trigonal Bipyramid	 Sawhorse or Seesaw	 T-shape	 Linear	
6	 Octahedral	 Square Pyramid	 Square Planar	 T-shape	 Linear

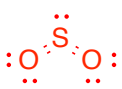
http://wikis.lawrence.edu/display/CHEM/2.2+VSEPR+Model++Part+II+(Mohit+Gupta)

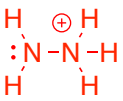
This table is very important. You should memorize it!

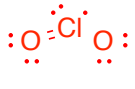
Questions:

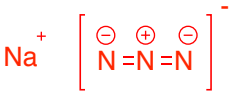
1. *Draw the lewis structure for the following species, make sure to note formal charge and resonance structures:*
   a. CO_3^{2-} *b. SO2 c.* $N_2H_5^+$ *d.*ClO_2 *e.*NaN_3

a. 

b. 

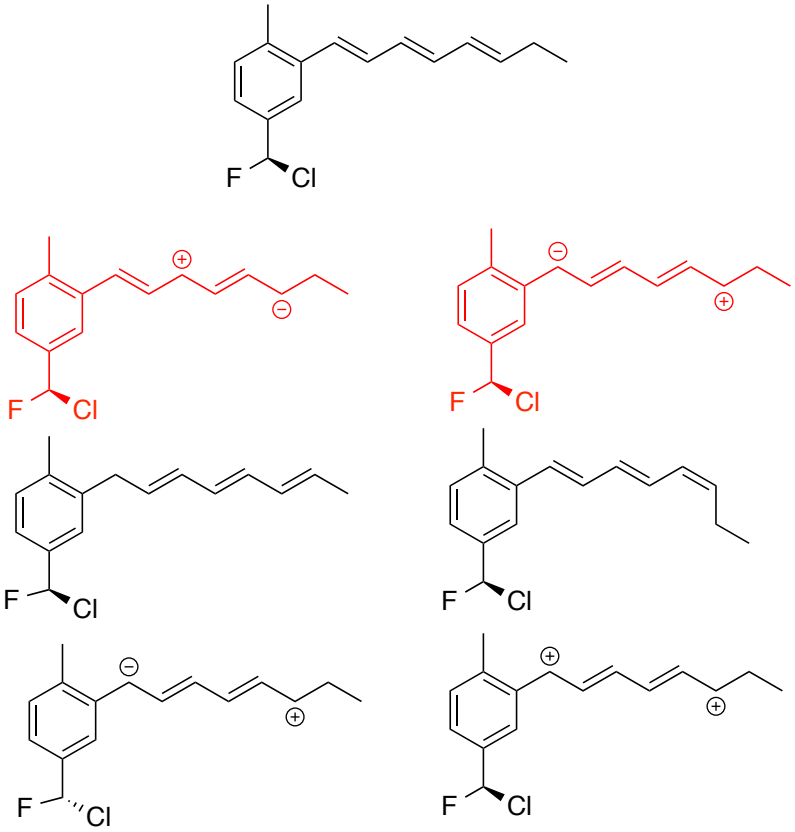
c. 

d. 

e. 

2. *Draw and name the molecular geometry of the above molecules.*
   a. Trignal Planar b. bent c. pyramidal(left N), tetrahedral(right N) d. bent e. linear(N_3^-)

3. *Which of the following structures are the resonance structure of the molecule below:*



4. Which of the following has smaller bond angle? (NF_3, NH_3)

NF_3 has smaller bond angle, because F is more electronegative, and the electron density around the N-F bond will be smaller than that of N-H bond, N-F bond thus occupies less space than N-H bond.