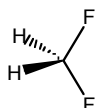


1. Draw Lewis structures for the following molecules using lines to indicate bonding electrons and dots to indicate nonbonding electrons. Be sure to show the correct 3-D structure of the entire molecule using VSEPR Theory. Also indicate ALL polar bonds in the molecule and the direction of the molecular dipole moment for each molecule (if any).



2. Consider three possible structures for methylene fluoride ( $\text{CH}_2\text{F}_2$ ), one tetrahedral (structure **A**), the others flat (structures **B** and **C**). Does the observation of a dipole moment in  $\text{CH}_2\text{F}_2$  allow you to decide between structures **A** and **B**? What about structures **A** and **C**?



**A**



**B**



**C**

3. Draw Lewis structures for  $\text{PCl}_3$  and  $\text{PCl}_5$ . Both of these molecules are stable compounds; however,  $\text{NCl}_3$  is a known compound while all attempts to synthesize  $\text{NCl}_5$  have failed. Explain why  $\text{NCl}_5$  probably will never be synthesized but  $\text{PCl}_5$  is readily prepared.