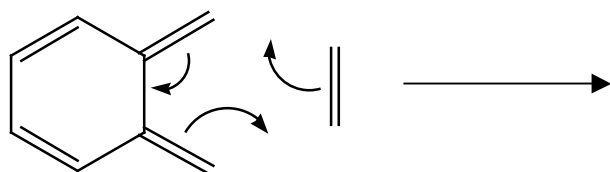


Problem Set #1
CH241-2001F

- [1] Write two Lewis structures for nitric oxide (NO) and assign formal charges to both atoms. What do you think would happen if you examined this molecule with an ESR instrument (see Problem 1.42 in text)?
- [2] Suggest a simple experiment, based on what you have learned in class so far, that would help you distinguish between the two molecules shown below.



- [3] Given below is an important reaction that will not be covered in class until the next semester! Yet, simply by following the arrows, predict what the product(s) might be.



- [4] Fluorine is much more electronegative than chlorine. The dipole moment of CH₃F (1.85 D), however, is somewhat less than that of CH₃Cl (1.90 D). Explain.
- [5] Consider HNCO and HOCN.
(a) Write a Lewis structure for each formula.
(b) Are the two compounds the same or different?
(c) Compare the anions produced when each of the two species loses a proton (H⁺). Are they the same or different?