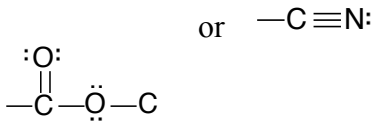
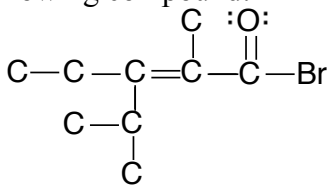
Chapter 3 Questions Name: _____

1. Define alkenes.
2. Write the 3 detailed steps for naming alkenes.
3. What does *cis*- mean?
4. What does *trans*- mean?
5. What must break temporality to interconvert between *cis* and *trans* isomers?
6. In order to be a *cis*-*trans* isomer, the carbon must be _____ substituted.
7. Is the *cis* or *trans* isomer more stable?
8. Identify which of the following has a higher priority and the appropriate sequence rule.
    a. $-CH_3$ or $-CH_2CH_3$

    b. $-CH_3$ or –Br

    c.  or
9. Using sequence rule 3, show the equivalence to  .
10. Identify the sequence rules used to determine higher priority for both sides and its *E, Z* designation for the following compound:

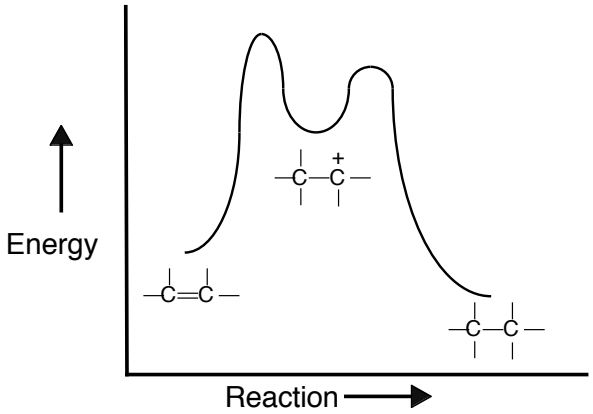


11. *E* stands for _____.
12. *Z* stands for _____.
13. Identify the type of reaction shown below:
    a. $H_2C{=}CH_2 + Cl_2 \rightarrow ClH_2C\text{-}CH_2Cl$
    b. $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$
    c. $ClH_2C\text{-}CH_2Cl \rightarrow H_2C{=}CH_2 + Cl_2$
    d. *cis*-2-butene → *trans*-2-butene
14. Identify the kind of reaction for the following:
    a. $A{:}B \rightarrow A\cdot + \cdot B$ _____
    b. $A{:}B \rightarrow A^+ + B^-$ _____
    c. $A\cdot + \cdot B \rightarrow A{:}B$ _____
    d. $A^+ + B^- \rightarrow A{:}B$ _____
15. Give an example from the above problem for the following substances:
    a. Polar
    b. Radical
    c. Electrophile
    d. Nucleophile
16. Red represents electron-_____ sites
17. Blue represents electron-_____ sites
18. A curved arrows show . . .

19. An overall detailed description of how a reaction occurs is called a(n) _____.
20. Define carbocation:

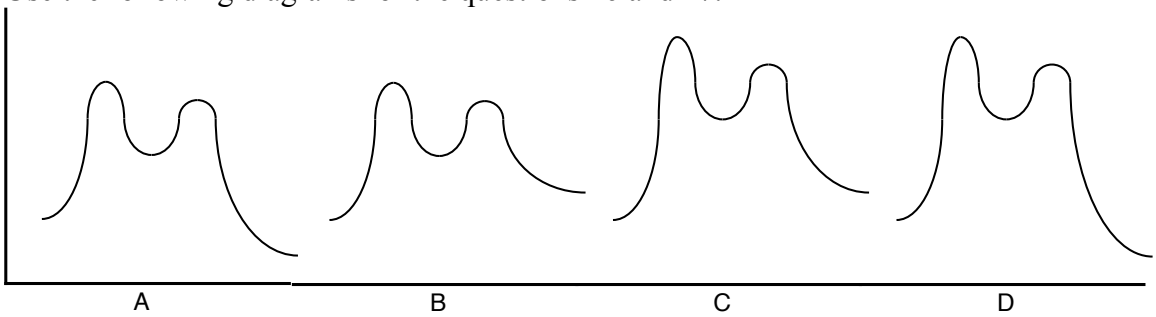
21. Which orbital lost an e- to make a carbocation?
22. What is the hybridization of a carbocation?
23. Draw a carbocation (use the orbital diagram to represent the lost electron).

24. Identify the reactants products, activation energies, transition states, and carbocation intermediate. Include ΔH for extra credit.



25. Does the **above** reaction favor the reactant side or the product side?

Use the following diagrams for the questions 26 and 27.



26. Which of the above reaction(s) is/are faster?
27. Which of the above form a more stable product (aka the product side is favored)?