

Name KEY

## Chapter 3: Review Guide Reactions of Alkenes

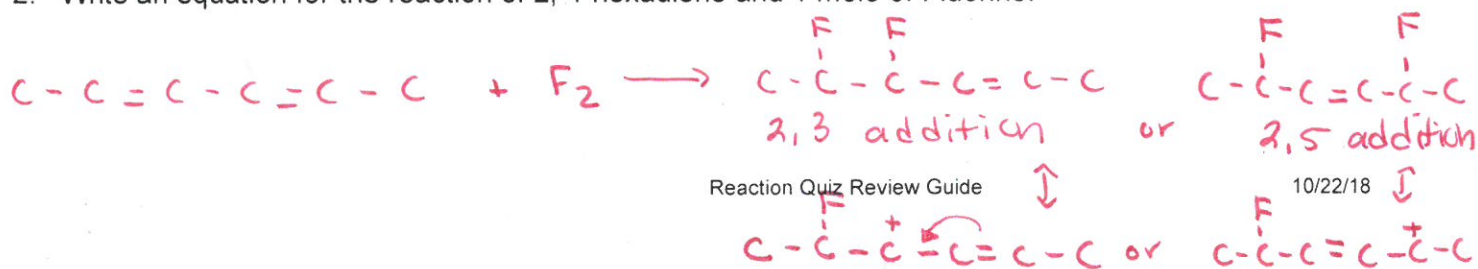
### NOTES:

- Use skeletal OR abbreviated formulas for all problems.
- Include reactants, organic and inorganic products, and catalysts, if applicable.
- If appropriate, show whether the *cis* or *trans* form of the product is produced.

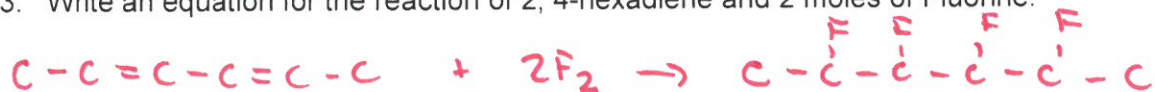
1. Write an equation for the reaction of 2,3-dimethyl-1-pentene with each of the following.

Reaction Type	Reaction
Water	$  \begin{array}{c} \text{C} & \text{C} \\   &   \\ \text{C} = \text{C} - \text{C} - \text{C} - \text{C} \end{array} + \text{H}_2\text{O} \xrightarrow{\text{H}^+} \begin{array}{c} \text{H} & \text{C} & \text{C} \\   &   &   \\ \text{C} - \text{C} - \text{C} - \text{C} - \text{C} \\   \\ \text{OH} \end{array}  $
Fluorine	$  \begin{array}{c} \text{C} & \text{C} \\   &   \\ \text{C} = \text{C} - \text{C} - \text{C} - \text{C} \end{array} + \text{F}_2 \rightarrow \begin{array}{c} \text{F} & \text{C} & \text{C} \\   &   &   \\ \text{C} - \text{C} - \text{C} - \text{C} - \text{C} \\   \\ \text{F} \end{array}  $
Hydrogen	$  \begin{array}{c} \text{C} & \text{C} \\   &   \\ \text{C} = \text{C} - \text{C} - \text{C} - \text{C} \end{array} + \text{H}_2 \xrightarrow[\text{Pt}]{\text{Ni, Pd}} \begin{array}{c} \text{H} & \text{C} & \text{C} \\   &   &   \\ \text{C} - \text{C} - \text{C} - \text{C} - \text{C} \\   \\ \text{H} \end{array}  $
HCl	$  \begin{array}{c} \text{C} & \text{C} \\   &   \\ \text{C} = \text{C} - \text{C} - \text{C} - \text{C} \end{array} + \text{HCl} \rightarrow \begin{array}{c} \text{H} & \text{C} & \text{C} \\   &   &   \\ \text{C} - \text{C} - \text{C} - \text{C} - \text{C} \\   \\ \text{Cl} \end{array}  $
Ozone	$  \begin{array}{c} \text{C} & \text{C} \\   &   \\ \text{C} = \text{C} - \text{C} - \text{C} - \text{C} \end{array} \xrightarrow{\text{O}_3} \text{C}=\text{O} + \text{O}=\begin{array}{c} \text{C} & \text{C} \\   &   \\ \text{C} & - \text{C} - \text{C} - \text{C} \end{array}  $
KMnO <sub>4</sub>	$  \begin{array}{c} \text{C} & \text{C} \\   &   \\ \text{C} = \text{C} - \text{C} - \text{C} - \text{C} \end{array} + \text{KMnO}_4 \xrightarrow[\text{purple solution}]{\text{H}_2\text{O}} \begin{array}{c} \text{OH} & \text{C} & \text{C} \\   &   &   \\ \text{C} - \text{C} - \text{C} - \text{C} - \text{C} \\   \\ \text{OH} \end{array} + \text{MnO}_2 + \text{KOH}  $ <p style="text-align: right;">brown ppt.</p>

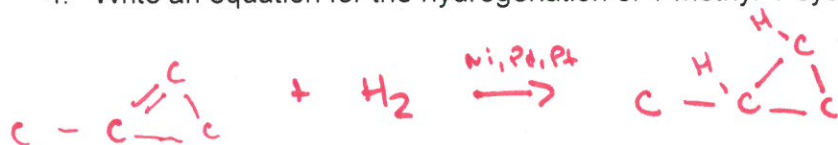
2. Write an equation for the reaction of 2, 4-hexadiene and 1 mole of Fluorine.



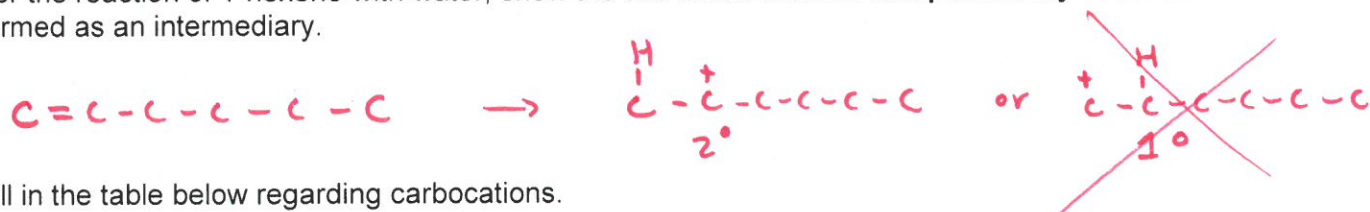
3. Write an equation for the reaction of 2, 4-hexadiene and 2 moles of Fluorine.



4. Write an equation for the hydrogenation of 1-methyl-1-cyclopropene.



5. For the reaction of 1-hexene with water, show the two **carbocations** that **potentially** could be formed as an intermediary.



6. Fill in the table below regarding carbocations.

Carbocation	Drawing/Example	Level of Stability
Unique methyl	$\text{H}-\overset{+}{\text{C}}-\text{H}$	Least
1° primary	$\text{H}-\overset{+}{\text{C}}(\text{H})-\text{R}$	↓
2° secondary	$\text{R}-\overset{+}{\text{C}}(\text{H})-\text{R}$	
3° tertiary	$\text{R}-\overset{+}{\text{C}}(\text{R})-\text{R}$	
		most

7. Which carbocation above would most likely be the final "desired" product of a reaction?



8. Draw the 2 possible carbocations, showing resonance, for 1-3-pentadiene.

