Chemistry 341
Problem Set 3
9/21/01

Print Name ________________________________

Circle your TA's name

Nate Bowling       Brian Lucas           Mon  3:30 pm       Tues 3:30 pm
Wendy deProphetis  Neil Strotman        4:35 pm          4:35 pm
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This assignment is intended to help you prepare for Exam 1.
The Problem Set will not be collected or graded.

1. List the following carbocations in order of increasing stability.

\[ A > B > C \]

least stable most stable
2. Consider the free radical monobromation of cyclopentane.

Each of the processes below represents one step in the reaction mechanism.

a) In the boxes, number the steps 1-4 to indicate the correct order in which they occur.

b) Label each step as an initiation, propagation, or termination step.

c) Draw in the correct “electron pushing” arrows to indicate bond breaking and formation in each step.
3. Draw structures for the major organic products of the following reactions. (It is **not necessary** to write a balanced reaction with respect to reagents and inorganic products.)

(a) \[
\begin{array}{c}
\text{HCl} \\
\end{array}
\]

(b) \[
\begin{array}{c}
\text{H}_2 \\
\text{Pt} \\
\end{array}
\]

(c) \[
\begin{array}{c}
\text{1) BH}_3 \\
\text{2) H}_2\text{O}_2 / \text{HO}^- \\
\end{array}
\]

(d) \[
\begin{array}{c}
\text{H}^+ \\
\text{H}_2\text{O} \\
\end{array}
\]
4. Upon ozonolysis and treatment with Zn in water, compound A yielded one mole of 1,3-pentanedione and two moles of formaldehyde, HCHO.

\[
\text{Compound A} \xrightarrow{1) O_3} \quad \xrightarrow{2) \text{Zn} / \text{H}_2\text{O}} \quad \begin{array}{c}
\text{1,3-pentanedi} \\
\text{acetone}
\end{array} + 2 \text{HCHO}
\]

Draw the structure of compound A.