

Names of all students (please print) _____

Answer Key

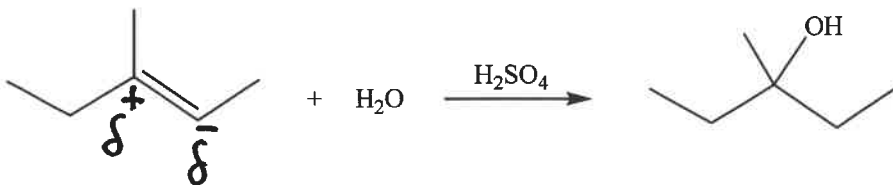
CHEM 243 Organic Chemistry I

Points _____ (10 max)

Worksheet #26: November 24, 2021. Complete the following worksheet by collaborating with a group of 3-4 students. You can use a text book or your lecture video notes. You must work together, with the names of all students included on **ONE** sheet and turned in for a group grade. **All the problems on this worksheet are Review Questions for Exam III.**

NOTE: The problems on Worksheets 24-28, and on the Study Guide for Exam IV, will be representative of the problems that might appear on the optional make-up exam.

(1) **Electrophilic Addition Reactions:**
General Mechanism Questions (video 8-2). Answer the following questions based on the reaction drawn at the right:

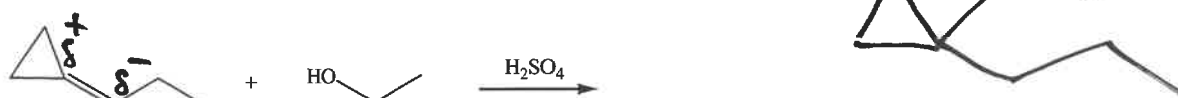
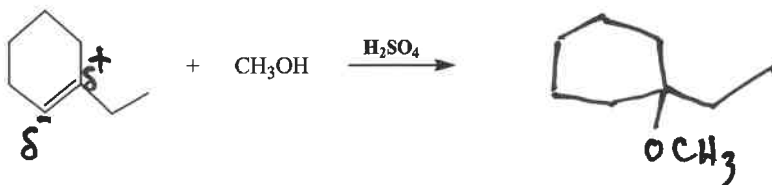
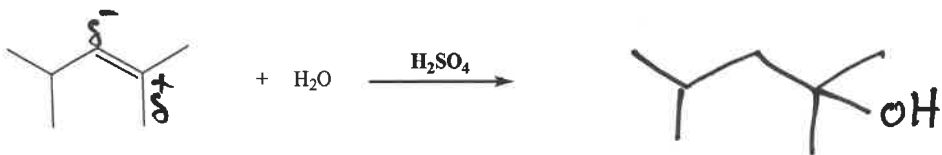


(a) Label the alkene double bond with δ^+ and δ^-

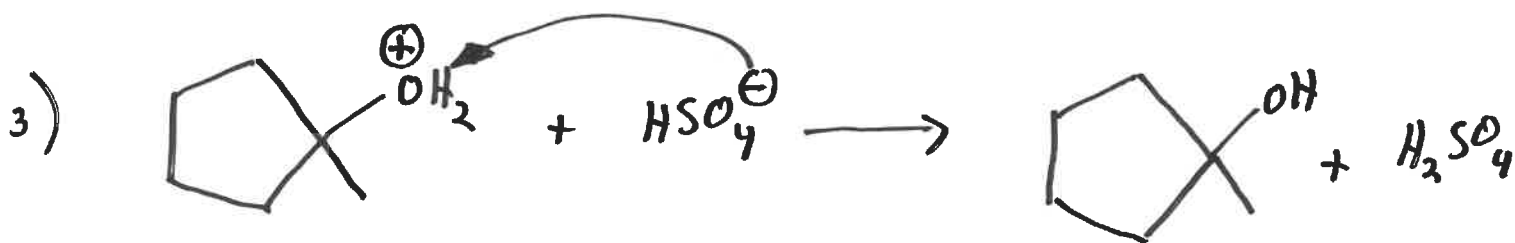
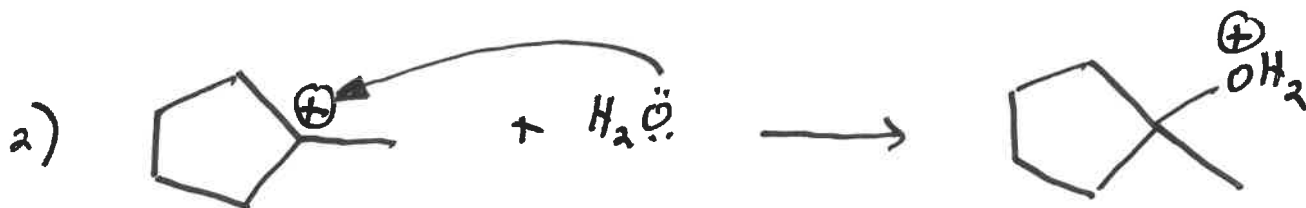
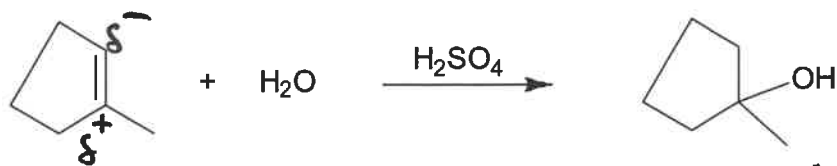
(b) (Circle the correct responses) The (H₂O, HSO₄⁻, H⁺) species becomes bonded to the δ^+ sp² carbon, and this species is referred to as the (nucleophile, electrophile, acid, base).

(c) (Circle the correct responses) The (H₂O, HSO₄⁻, H⁺) species becomes bonded to the δ^- sp² carbon, and this species is referred to as the (nucleophile, electrophile, acid, base).

(2) **Electrophilic Addition Reactions.** Complete the **Electrophilic Addition Reactions** shown below by drawing the structure of the major, neutral organic products. It is NOT necessary to balance these reactions or write the mechanism. There are NO rearrangements and NO intramolecular reactions. Do Not worry about stereochemistry.



(3) **Electrophilic Addition Mechanism: Acid Catalyzed Addition of H₂O to an Alkene (3 steps).** Write a complete mechanism that explains the formation of all products in the balanced net reaction shown below. Your mechanism must consist of a series of individual, balanced chemical equations, and curved arrows to show electron pair movement.



What is the purpose of the H₂SO₄ in your mechanism, and in which Step is the H₂SO₄ being used? Be specific!

The H₂SO₄ is an acid catalyst + supplies the electrophile (H⁺) to the alkene reactant. The H₂SO₄ is used in step #1 of the mechanism.