

Names of all students (please print) \_\_\_\_\_

Key

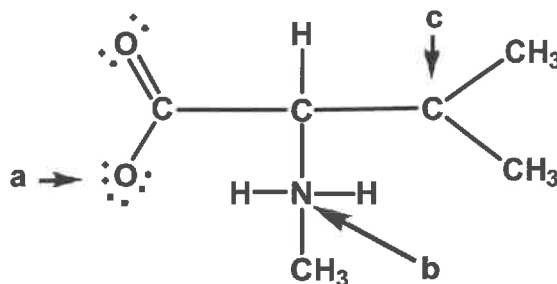
CHEM 243 Organic Chemistry I

Points \_\_\_\_\_ (10 max)

**Worksheet #1: September 3, 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.

(1) **Formal Charge.** In the structure drawn to the right, what is the Formal Charge for atoms:

(a) -1 (b) +1 (c) +1



(2) **Covalent Bonds, Hybridization, and Molecular Geometry.** For the structure drawn below:

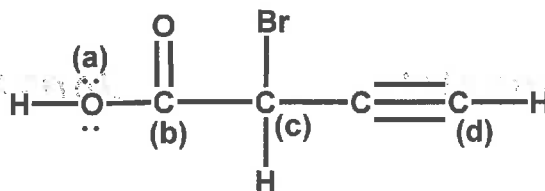
What is the Hybridization and Geometry for atoms labeled (a) – (d):

(a) sp<sup>3</sup> and bent

(b) sp<sup>2</sup> and trigonal planar

(c) sp<sup>3</sup> and tetrahedral

(d) sp and linear



What is the total number of sigma ( $\sigma$ ) covalent bonds in this structure 9

What is the total number of pi ( $\pi$ ) covalent bonds in this structure 3

(3) **For the structure drawn at the right:**

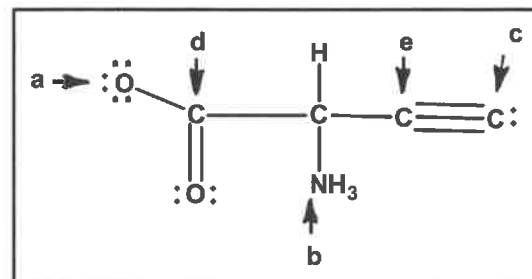
(a) What is the Formal Charge for: (a) -1 (b) +1 (c) -1

(b) What is the hybridization for: (b) sp<sup>3</sup> (d) sp<sup>2</sup> (e) sp

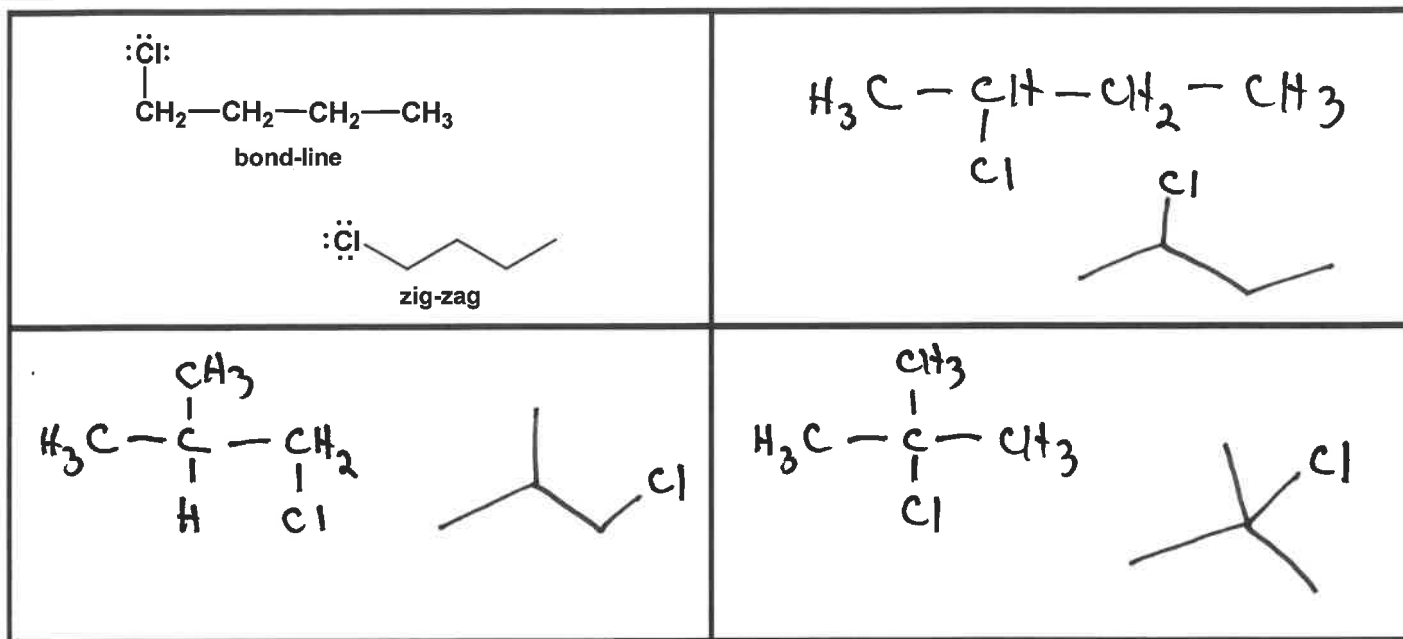
(c) What is the molecular geometry for:

(b) tetrahedral (d) trigonal planar (e) linear

(d) What is the total number of pi ( $\pi$ ) covalent bonds in this structure 3

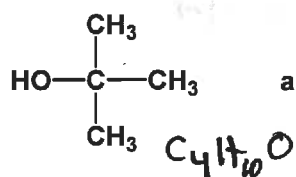


(4) **Constitutional Isomers.** Given the molecular formula  $C_4H_9Cl$ , in the boxes below draw reasonable structures for **four** Constitutional isomers. You can draw either bond-line or zig-zag structures. **One example is given for you.**

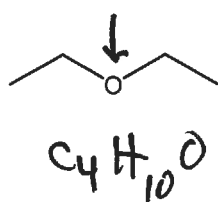


(5) **Comparing Organic Structures.** Are the following pairs of organic compounds:

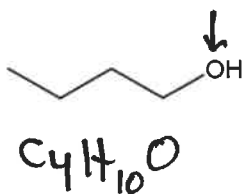
Constitutional Isomers or Identical or Different



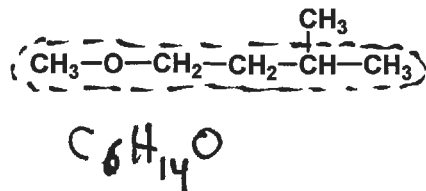
Different



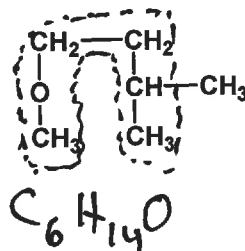
and



Constitutional



and



Identical

**When your group has completed this Worksheet.....**

- Copy your best answers to a fresh worksheet with the names of all students from your group
- Hand in to Dr. Brush
- If there is still time left in class:
  - You can leave, or...
  - Work on Worksheet Zero