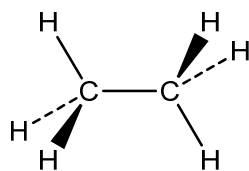


CHEM1102 Worksheet 1 – Answers to Critical Thinking Questions

The worksheets are available in the tutorials and form an integral part of the learning outcomes and experience for this unit.

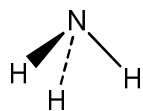
Model 1: Bonding in Organic Molecules

1. Four.



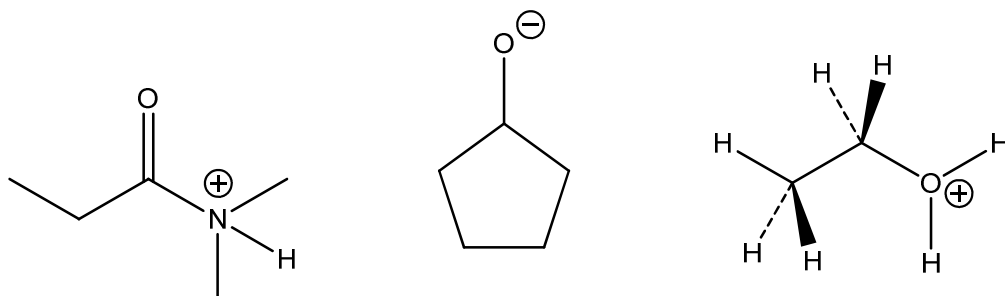
2. Two.

3. It occupies the position of a bond, causing the shape to be pyramidal rather than planar.



4. Negative charge: one less bond than typical. Positive charge: one more bond than typical.
Number of bonds = typical number + charge.

5. See below.



Model 2: Hybridization

1. Each is made up by mixing $2s$ with three $2p$ orbitals. Each is 25% $2s$ and 75% $2p$.

2. Three hybrid orbitals would result. They are arranged in a trigonal plane with 120° between them.

3. sp^2

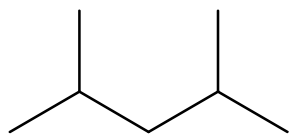
4. The p -orbital that is left over has 1 electron in it. It can combine with the p -orbital on the other carbon to make a π bond with 2 electrons in.

5. Weaker due to poorer overlap.

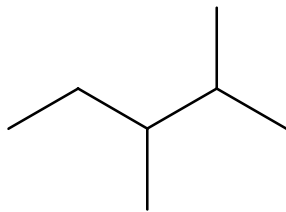
6. 2 bonds: a double bond.

Model 3: Naming Organic Molecules

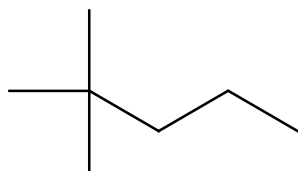
1. See below.



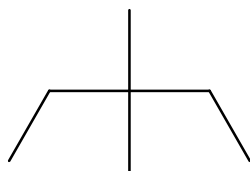
2,4-dimethylpentane



2,3-dimethylpentane



2,2-dimethylpentane



3,3-dimethylpentane

2. See above.

3. Yes.

4. See above.

Key to success: practice further by completing this week's tutorial homework

Key to even greater success: practice even further by completing this week's suggested exam questions.