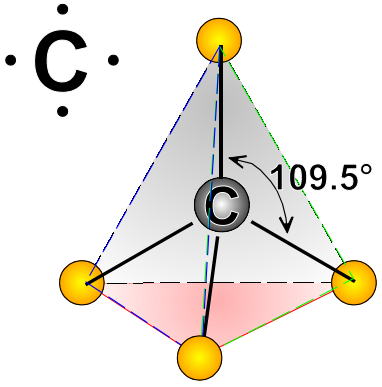
Amazing Carbon



Carbon is found in group 14 on the *Periodic Table*. It is a metalloid, and can bond with metals and nonmetals alike. Carbon is also the most active member of its family, so it forms many compounds. The most amazing thing about carbon is that, because of its electron configuration, it can form covalent bonds with up to four elements at once including itself. When carbon bonds with itself, it can form chains of unlimited length. These chains can be straight, branched, or closed to form rings. It can form single bonds by sharing one pair of electrons. When it does, it is shaped like a regular tetrahedron with 109.5° bond angles, although on paper the bond angles are normally drawn at 90° as in the electron dot diagram. Carbon also forms double and triple bonds. As a result, the variety and complexity of carbon compounds is unlimited. It is no wonder that carbon is the backbone for the most complicated chemicals including life itself. Because of the complexity of carbon compounds it is easiest to describe and understand them by drawing the structure rather than using the simple formula.

Answer the questions below based on the reading above, and on your knowledge of chemistry.

1. Draw an electron dot diagram of carbon as shown above. Count the number of unpaired electrons. These are bonding sites. Then draw a second carbon bonded to the first. Count the number of unpaired electrons now.

   What happens to the number of bonding sites as the number of carbons bonded together increases? _____

   _____

2. Draw an electron dot diagram of the compound CH_4 in the space below. Then simplify your drawing by redrawing it with a single line to represent each bonding electron pair.

3. Draw C_3H_8 using a single line to represent each bonding electron pair. Remember each carbon must have 4 bonds and each hydrogen must have 1 bond.

4. Draw a diagram of C_3H_6. Apply the same rules as above. If necessary, use a double bond.

5. Draw two different diagrams of C_2H_6O. Apply the same rules as above

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