Video (TVO): Organic Chemistry (1)

Carbon the Compromiser

1. In 1828, Wholer produced the organic compound _____ from ammonium cyanate.
2. What elements were found to be involved in organic chemistry?

   _____
3. Kekule assigned a valence of _____ to carbon, which meant it, could make _____ bonds.
4. Ethane and butane are made of _____, _____ carbon atoms, respectively.
5. Benzene (C_6H_6) is made of a _____ of 6 carbon atoms.
6. The ability of atoms to attract electrons is defined as _____.
7. Carbon has an electronegativity of _____.
8. Carbon has 2 choices during bonding: _____
9. Since carbon's electronegativity is 2.5, it compromises during bonding and forms 4 _____ bonds

The Shape of Carbon

1. Methane has the chemical structure: _____
2. The 2p orbitals are arranged around the atom and are aligned along the _____.
3. What must carbon do with its 2s and 2p orbitals? _____
4. During bonding, one of the 2s electrons is promoted to the _____.
5. All four hybridized orbitals of carbons have equal _____.
6. In one of the simplest carbon compounds, carbon forms _____ bonds with hydrogen to form _____.

Carbon Bonding

1. In ethane, 2 carbon atoms are joined together by overlapping a _____ orbital from each carbon.
2. The carbon-carbon single bonds are called _____ bonds.
3. When a double bond is formed in carbon compounds like ethylene (ethene):
   i) One 2s and two 2p orbitals are hybridized resulting in 3 _____
   ii) The other 2p orbital is imagined to be _____ to these hybrid orbitals.

iii) The double bond is formed by overlapping one_____ orbital from each carbon atom (sigma bond) and overlapping the only _____ orbitals from each carbon forming a _____ bond.

4. The pi bond electrons move from _____ the sigma bond to _____ the sigma bond.
5. Therefore, the double bond (C=C) is composed of both a _____ and _____ bond.
6. During chemical reactions, it is the site of _____ bond which is susceptible to attack because the electrons are held more _____ because they are _____ from the nucleus.
7. In the structure of benzene, the electrons from the pi bonds form a _____shaped cloud above and below the benzene carbon ring.
8. Some uses for carbon compounds are: _____
9. In organic chemistry modeling, most of the time we are only interested in showing the _____
10. "Free radicals" are characterized by _____.
11. Parts of a molecule that are not involved in a reaction can be represented by _____.

Fixing Fuels

1. Petroleum contains over _____.
2. This diversity is caused by _____.
3. Different structures that have the same formula are called _____
4. Carbon forms _____, _____ and _____ structures
5. Raw natural gas is composed of _____
6. Some impurities that must be removed from raw natural gas before it can be used are: _____ and _____.
7. Petroleum "fractions" must be separated by a process of _____. This process is based on _____. In the distillation column, the heavy fractions (i.e. oils) at the _____ while the lighter fractions (i.e. gasoline) are removed at the _____.
8. A catalytic _____ is used to break large hydrocarbons into _____ hydrocarbons.