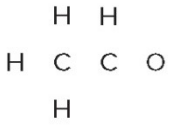
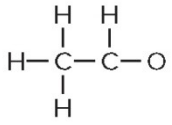
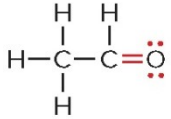
Label each bond in the following compounds as ionic or covalent.

a. F_2 b. LiBr c. CH_3CH_3

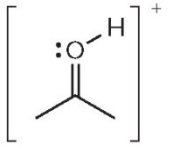
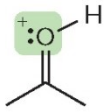
Drawing Lewis structures

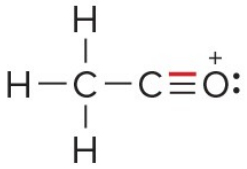
1 Arrange the atoms with H's on the periphery.	2 Count valence electrons.	3 Add single bonds.	4 Complete octets with multiple bonds and lone pairs.
	2 C's x 4 e^- = 8 4 H's x 1 e^- = 4 1 O x 6 e^- = 6 total e^- = 18	 12 e^- used.	 Add one double bond and two lone pairs to complete O and C octets.

Draw an acceptable Lewis structure for each compound, assuming the atoms are connected as arranged.

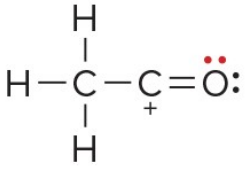
a. HCN H C N

b. C_3H_4 

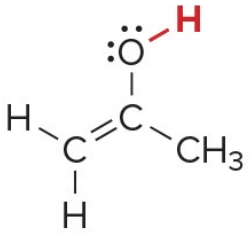
1 Use the group number to determine the number of valence electrons for each atom in the structure.	2 Subtract the number of electrons owned by each atom from the group number to give the formal charge.
 C: 4 e⁻ H: 1 e⁻ O: 6 e⁻	 C: 4 e⁻ – 4 e⁻ = 0 H: 1 e⁻ – 1 e⁻ = 0 O: 6 e⁻ – 5 e⁻ = +1



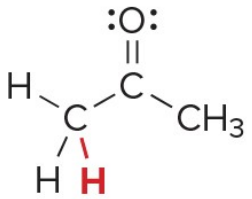
A



B



C

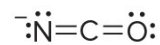
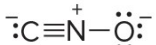


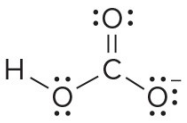
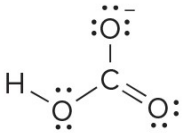
D

- **A** and **B** are **resonance** structures.
- The position of one electron pair (in red) is different.

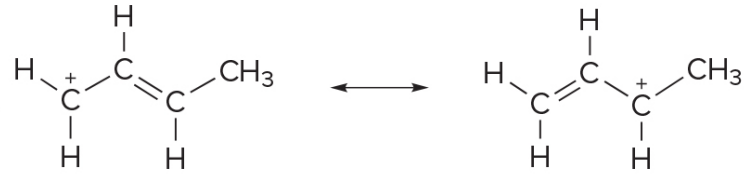
- **C** and **D** are **isomers.**
- The position of a H atom (in red) is different.

Classify each pair of compounds as isomers or resonance structures.

a.  and 

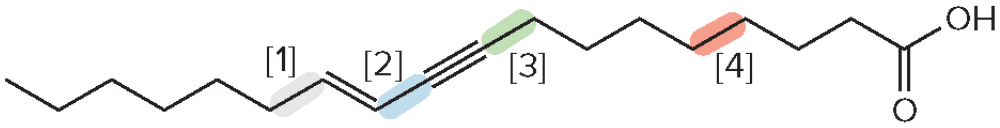
b.  and 

Problem 1.14 Use curved arrow notation to show how the first resonance structure can be converted to the second.

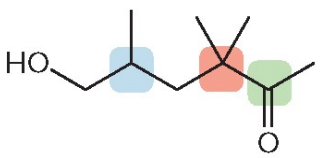
a. 

b. 

Problem 1.34 Rank the labeled bonds in santalbic acid, a fatty acid obtained from the seeds of the sandalwood tree used in cosmetics, in order of increasing bond length.

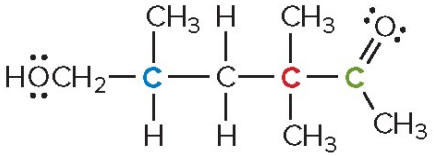


Converting structures



skeletal structure

=



$C_9H_{18}O_2$

=

$HOCH_2CH(CH_3)CH_2C(CH_3)_2COCH_3$

condensed structure

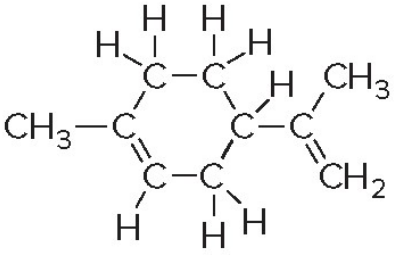
Convert each molecule to a skeletal structure.

a. $(CH_3)_2CHCH_2CH_2CH(CH_3)_2$

b. $CH_3CH(Cl)CH(OH)CH_3$

c. $CH_3(CH_2)_2C(CH_3)_2CH(CH_3)CH(CH_3)CH(Br)CH_3$

d.



limonene
(oil of lemon)