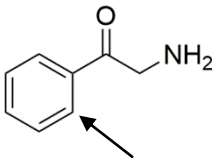
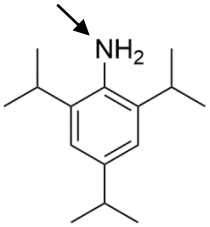
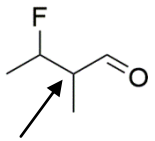
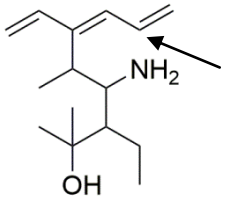
Line Formula and Valence Bond Theory Practice KEY
Chemistry 301

				
Write the **molecular formula** for this compound.	C_8H_9NO	$C_{15}H_{25}N$	C_5H_9FO	$C_{15}H_{27}NO$
How many total **lone pairs** would be on atoms in this compound?	3	1	5	3
What is the **electronic geometry** around the atom indicated by the arrow?	Trigonal Planar	Tetrahedral	Tetrahedral	Trigonal Planar
What is the **molecular geometry** around the atom indicated by the arrow?	Trigonal Planar	Trigonal Pyramidal	Tetrahedral	Trigonal Planar
Indicate the following **bond angles,** where the central atom listed is the atom indicated by the arrow?	C-C-C 120° C-C-H 120°	C-N-H 107° H-N-H 107° (Close to 109.5°. A little less due to the lone pair.)	C-C-C 109.5° C-C-H 109.5°	C-C-C 120° C-C-H 120°
What is the **hybridization** of the atom indicated by the arrow?	sp^2	sp^3	sp^3	sp^2

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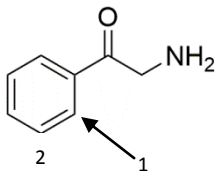
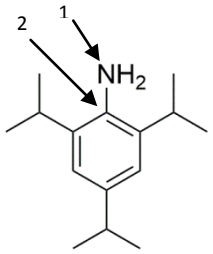
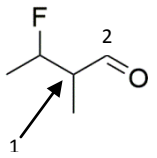
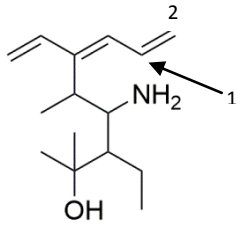
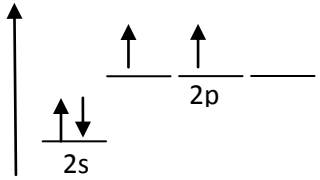
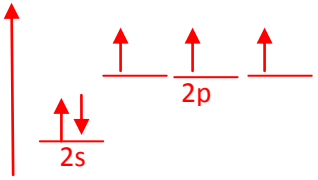
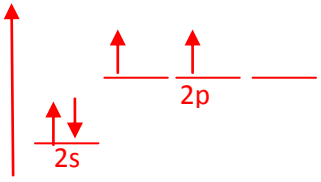
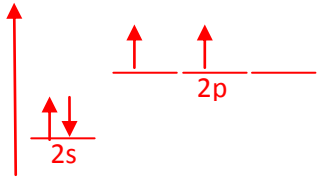
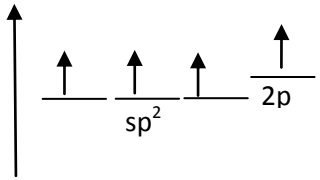
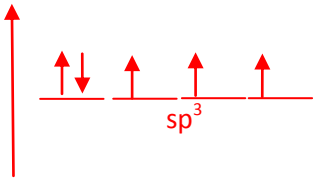
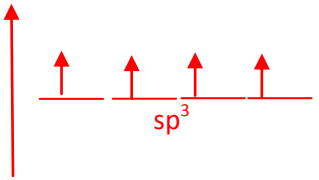
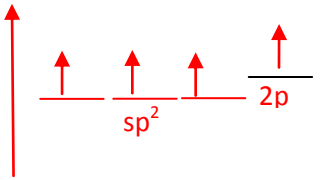
				
For the atom indicated by the arrow, show the **atomic orbital diagram** for the valence electrons in the isolated atom (i.e. before it is bonded). The first one has been done for you.		Done for N: 		
Now, for the same atom, show the **orbital diagram** for the atom now that it is bonded. The first one has been done for you.				
Describe the bonding for the bond between the atoms designated as 1 and 2. Include which orbitals are overlapping to form what types of bonds.	A sp^2 hybrid orbital from atom #1 overlaps with a sp^2 hybrid orbital from atom #2 to form a sigma bond. The p orbitals from the same two atoms overlap with side-on overlap to form a pi bond.	A sp^3 hybrid orbital from atom #1 overlaps with a sp^2 hybrid orbital from atom #2 to form a sigma bond.	A sp^3 hybrid orbital from atom #1 overlaps with a sp^2 hybrid orbital from atom #2 to form a sigma bond.	A sp^2 hybrid orbital from atom #1 overlaps with a sp^2 hybrid orbital from atom #2 to form a sigma bond. The p orbitals from the same two atoms overlap with side-on overlap to form a pi bond.

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