

These problems are for practice in determining the hybridization of the central atom of a molecule by the structure and using orbital diagrams to confirm the Lewis Structure.

For the following molecules complete the following:

- 1) Draw (or complete) the Lewis Structure
 - 2) Predict the Hybridization of the central atom.
 - 3) Using an orbital diagram, show this hybridization.
 - 4) Identify the number of sigma and pi bonds in both the structure and your orbital diagram.
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NH₃

Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

Orbital Diagram:

PF₅

Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

Orbital Diagram:



Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

Orbital Diagram:



Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

Orbital Diagram:

HCN

Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

Orbital Diagram:

TeF₅⁻¹

Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

Orbital Diagram:



Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

Orbital Diagram:



Hybridization: _____

of Sigma Bonds: _____

of Pi Bonds: _____

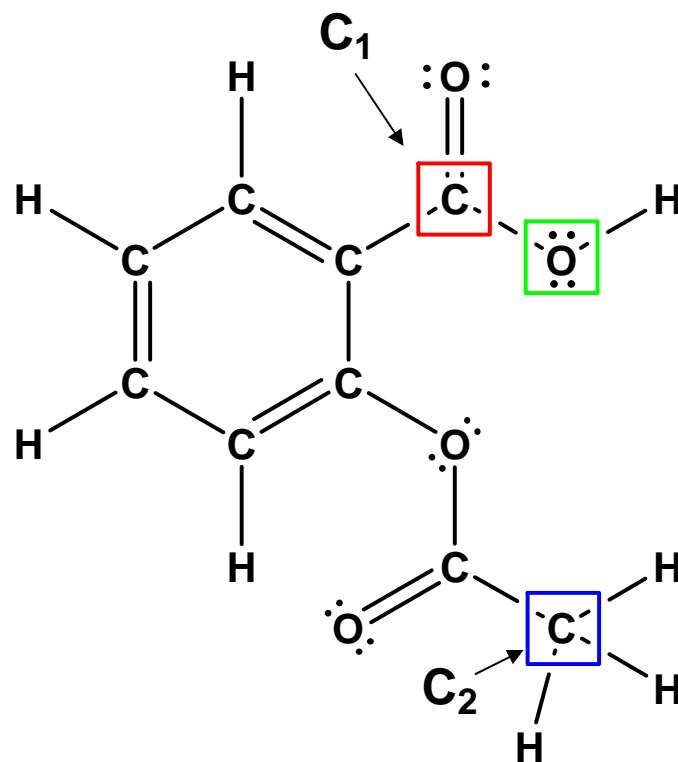
Orbital Diagram:

For this problem, do each indicated atom individually below.

In addition, answer the following:

How many sigma bonds total are in the structure?

How many pi bonds total are in the structure?



C₁ Hybridization: _____ # of Sigma Bonds: _____ # of Pi Bonds: _____
Orbital Diagram:

C₂ Hybridization: _____ # of Sigma Bonds: _____ # of Pi Bonds: _____
Orbital Diagram:

O Hybridization: _____ # of Sigma Bonds: _____ # of Pi Bonds: _____
Orbital Diagram: