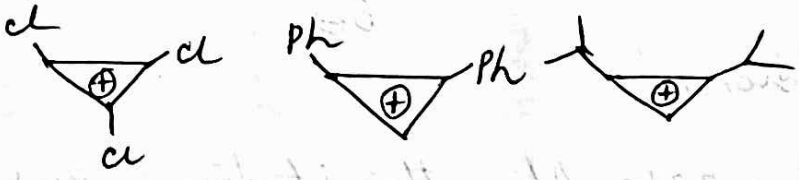
Cyclopropenone

cyclopropenone

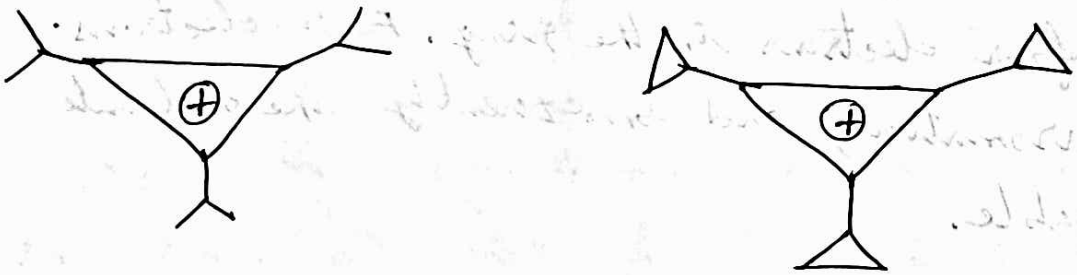
Cyclopropenone is a stable molecule as the electronegative oxygen atom withdraws two C=O electrons toward itself leaving only two electrons in the ring. This is a Huckel number and follow $(4n+2)\pi$ electron rule. Therefore cyclopropenone generates aromaticity.

More Examples

Cyclopropenyl carbocations

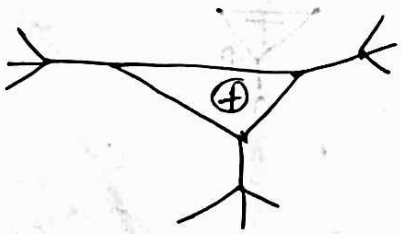
1. 

They are stable despite the 60° angles.

2. 

tripropylcyclopropenyl cation tricyclopropylcyclopropenyl cation

These cations are among the most stable carbocations known.

3. 

tri-t-butylcyclopropenyl cation

This is also very stable carbocation.

Cyclobutadiene

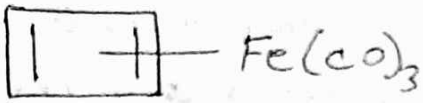
Ex:

Cyclobutadiene

Cyclobutadiene is cyclic, planar and fully conjugated. However, it has 4π electrons. Therefore, according to Huckel's rule it is antiaromatic compound.

In fact, cyclobutadiene is very unstable and readily dimerizes by a Diels-Alder reaction.

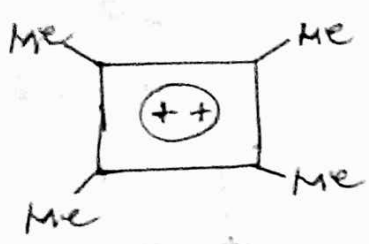
It is, however, stable when it forms complexes with metals. Here, metal withdraws electrons from the cyclobutadiene ring.

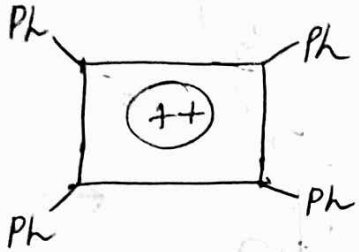


Stable organometalic compound

These cyclobutadiene – metal complexes behave as aromatic ligands and undergo aromatic substitution.

4.





These dications have been prepared and they represent aromatic systems of two electrons.