

CHEM HELP *ASAP*

Organic Chemistry Problem Set Solutions

Identify Aromatic Rings

Instructions: For each question, determine (1) whether the ring is aromatic (Y or N) and (2) the number of pi electrons in the aromatic ring.

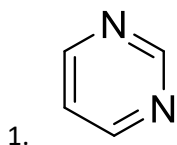
Suggested playlist

<https://www.youtube.com/watch?v=z5EFWm90o7w&list=PLlzSRqjN72jcRgDFxxnIhrSyDG21CMRd3>
(aromaticity and resonance)

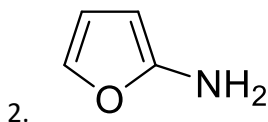
YouTube video of answered questions:

<https://youtu.be/DsNw-7sj8ls>

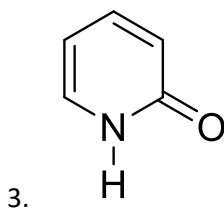
Questions & solutions:



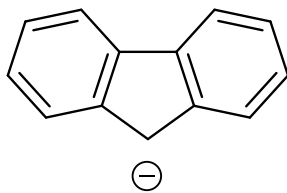
YES, 6 electrons (nitrogen lone pairs are in hybrid orbitals – no p-orbitals)



YES, 6 electrons (1 oxygen lone pair is in a p-orbital, nitrogen is not part of the ring and has no effect)

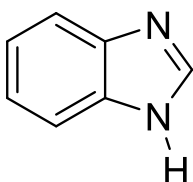


NO (two C-C pi bonds + N lone pair gives 6, but the carbonyl carbon is part of the ring and will disrupt the aromaticity – can draw an aromatic resonance form)



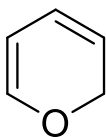
4.

YES, 14 electrons (a large, 13-membered ring around the entire perimeter of the molecules gives 14 total electrons including the lone pair on carbon, which is in a p-orbital)



5.

YES, 10 electrons (top nitrogen lone pair does not count and is in an sp^2 hybrid orbital, lower nitrogen lone pair is in a p-orbital and does count)



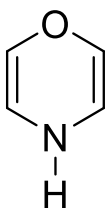
6.

NO (6 electrons is possible, but the CH_2 in the ring is sp^3 hybridized and does not allow the ring to be aromatic)



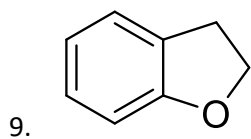
7.

NO (the two pi bonds give 4 electrons and the nitrogen lone pair cannot be counted because it is in an sp^2 hybrid, not a p-orbital)

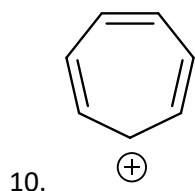


8.

NO (the two pi bonds give 4 electrons but if each ring atom is sp^2 hybridized then lone pairs on nitrogen and oxygen would also be added to give 8 electrons – not aromatic)



YES, 6 electrons (the benzene ring is aromatic, but the carbons in the second possible ring are sp^3 hybridized)



YES, 6 electrons (the three C-C pi bonds provide 6 electrons and the remaining carbon has a vacant p-orbital)