

Aromaticity Chemistry Questions with Solutions

Q1. What is Huckel's rule of aromaticity?

Answer: Huckel's rule of aromaticity states that a compound is aromatic if-

- (a) The molecule is planar
- (b) The molecule has $4n + 2\pi$ electrons
- (c) The molecule is cyclic.

Q2. What are antiaromatic compounds?

Answer: Anti-aromatic compounds are those compounds which are cyclic, planar and have $4n\pi$ electrons.

Q3. What are homo-aromatic compounds?

Answer: The compounds which have a saturated carbon atom interrupting the conjugation in the aromatic system are called homo-aromatic compounds.

Q4. What are quasi-aromatic compounds?

Answer: The compounds in which the positive and negative charges in the molecule are a part of the aromatic system are called quasi-aromatic compounds.

Q5. Give an example of a quasi-aromatic compound.

Answer: Cyclopropenone is an example of a quasi-aromatic compound.

Q6. What an example of antiaromatic compound.

Answer: Cyclobutadiene is an example of an antiaromatic compound.

Q7. Match the following items of column 1 with column 2 and choose the correct answer:

Column 1	Column 2
1) Pyridine	a) Non aromatic
2) Cyclopentadienyl cation	b) Aromatic

3) Tropylium cation	c) Anti aromatic
4) cyclooctatetraene	d) Homo aromatic

Answer:

Column 1	Column 2
1) Pyridine	b) Aromatic
2) Cyclopentadienyl cation	c) Anti Aromatic
3) Tropylium cation	d) Homo aromatic
4) cyclooctatetraene	a) Non aromatic

Q8. What is the full form of NICS?

Answer: NICS stands for Nuclear Independent Chemical Shift.

Q9. What does a positive NICS value indicate?

Answer: Positive NICS value indicates anti-aromatic compound.

Q10. What does a negative NICS value indicate?

Answer: Negative NICS value indicates aromatic compound.

Q11. Which kind of ring current is present in benzene?

Answer: Diamagnetic ring current is present in benzene.

Q12. What kind of ring current is seen in antiaromatic compounds?

Answer: Paramagnetic ring current is present in antiaromatic compounds.

Q13. Is thiophene aromatic?

Answer: Yes, thiophene is an aromatic compound.

Q14. Arrange benzene, pyridine, thiophene, pyrrole and furan in decreasing order of their aromaticity.

Answer: The decreasing order of stability is as follows:

Benzene > Pyridine > Thiophene > Pyrrole > Furan.

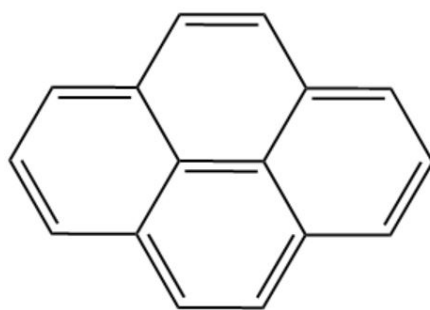
Q15. What is the bromine test?

Answer: Bromine test is a confirmatory test for unsaturated hydrocarbons. The unsaturated hydrocarbon turns the brown color of bromine solution to colorless.

Practice Questions on Aromaticity

Q1. How many pi bonds are present in the aromatic compound Pyrene?

Answer: There are 8 pi bonds in the aromatic compound Pyrene.



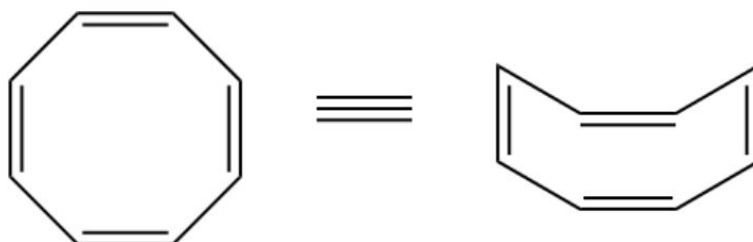
Pyrene

Q2. Does pyrene decolourize bromine water?

Answer: Yes, Pyrene- an aromatic compound decolourises bromine water.

Q3. Is cyclooctatetraene an aromatic compound?

Answer: Cyclooctatetraene is not an aromatic compound. It is a non-aromatic compound. It is a tub shaped compound.



Q4. What is the resonance energy of benzene?

Answer: The resonance energy of benzene is 36 kcal mol^{-1} .

Q5. What is the difference between 1,3,5 cyclohexatriene and benzene?

Answer: The difference between 1,3,5 cyclohexatriene and benzene is that all 6 C-C bonds of benzene have the same bond length but 1,3,5 cyclohexatriene has different C=C and C-C bond lengths.