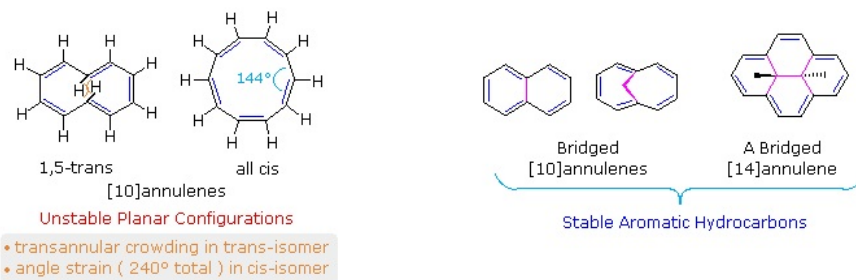


## 17.8: POLYCYCLIC AROMATIC HYDROCARBONS

### AROMATIC COMPOUND WITH A SINGLE RING



### AROMATIC COMPOUNDS WITH MORE THAN ONE RING

Benzene rings may be joined together (fused) to give larger polycyclic aromatic compounds. A few examples are drawn below, together with the approved numbering scheme for substituted derivatives. The peripheral carbon atoms (numbered in all but the last three examples) are all bonded to hydrogen atoms. Unlike benzene, all the C-C bond lengths in these fused ring aromatics are not the same, and there is some localization of the pi-electrons.

The six benzene rings in coronene are fused in a planar ring; whereas the six rings in hexahelicene are not joined in a larger ring, but assume a helical turn, due to the crowding together of the terminal ring atoms. This helical configuration renders the hexahelicene molecule chiral, and it has been resolved into stable enantiomers.

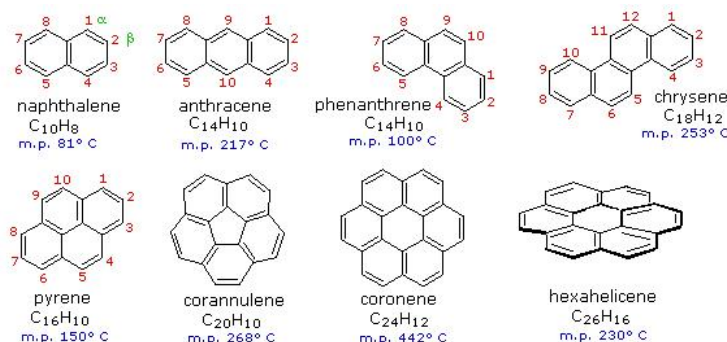
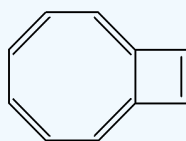


Figure 2: Examples of Polycyclic Aromatic Hydrocarbons (PAHs).

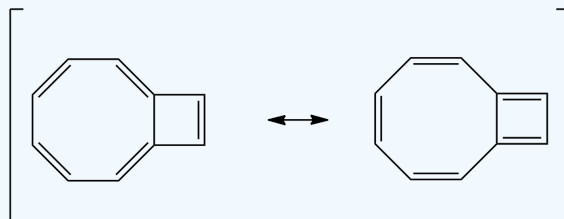
#### Exercise

9. This is an isomer of naphthalene. Is it aromatic? Draw a resonance structure for it.



#### Answer

9. Yes, it is aromatic.  $4n+2$  pi-electrons.



## CONTRIBUTORS AND ATTRIBUTIONS

- [Dr. Dietmar Kennepohl](#) FCIC (Professor of Chemistry, [Athabasca University](#))
- Prof. Steven Farmer ([Sonoma State University](#))
- William Reusch, Professor Emeritus ([Michigan State U.](#)), [Virtual Textbook of Organic Chemistry](#)

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