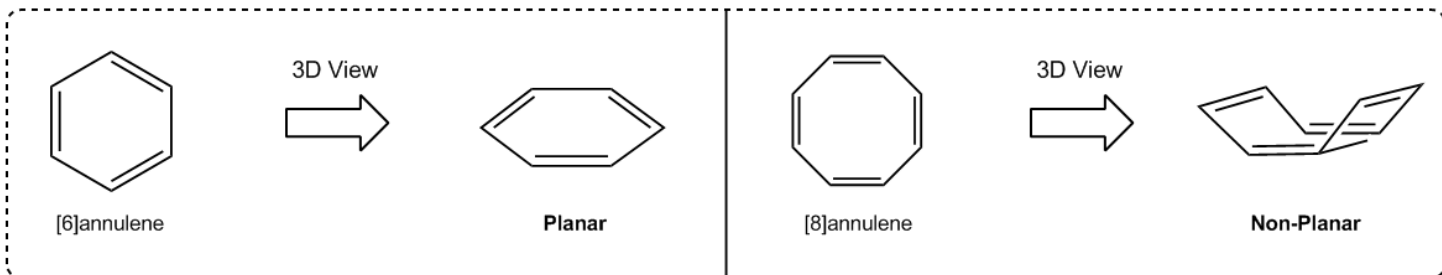


CONCEPT: AROMATICITY OF ANNULENES

An **annulene**, sometimes referred to as a *polyolefin*, is the name given to a fully conjugated monocyclic hydrocarbon.

- Due to their simple structure, rings of different sizes can be named as $[n]$ annulenes, where n = number of carbons
 - As annulenes get bigger, the challenge becomes predicting *planarity*.



Predicting Annulene Planarity:

Pertaining to All-*cis* annulenes,

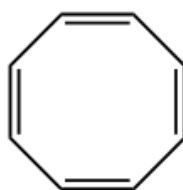
EXAMPLE: Cyclooctatetrene vs. Cyclooctatetraene dianion

- If $4n + 2 \pi$ electrons

- $10+$ = Non-aromatic
- 9 or less = Aromatic

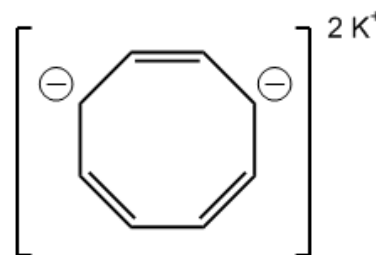
- If $4n \pi$ electrons

- $8+$ = Non-aromatic
- 7 or less = Antiaromatic



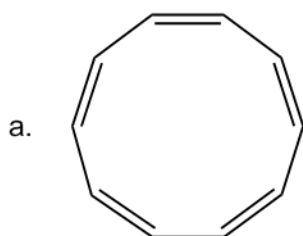
[8]annulene

vs.

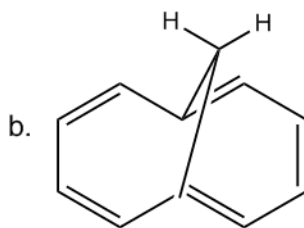


[8]annulene dianion

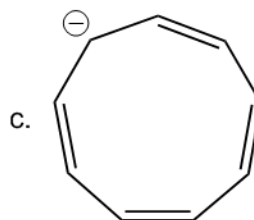
EXAMPLE: Determine if the following annulenes display any form of aromaticity.



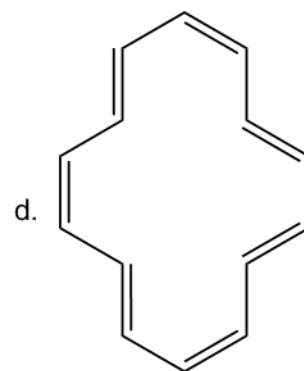
All-*cis* [10]annulene



[10]annulene
with methylene bridge



All-*cis* [9]annulene anion



[14]annulene