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Hückel ($4n + 2$) rule

Monocyclic planar (or almost planar) systems of trigonally (or sometimes digonally) hybridized atoms that contain ($4n + 2$) π-electrons (where n is a non-negative integer) will exhibit aromatic character. The rule is generally limited to $n = 0–5$. This rule is derived from the Hückel MO calculation on planar monocyclic conjugated hydrocarbons $(CH)_m$ where m is an integer equal to or greater than 3 according to which ($4n + 2$) π-electrons are contained in a closed-shell system. Examples of systems that obey the Hückel rule include:

cyclopropenyl cation
(= 3, = 0)*mn*

cyclopentadienyl anion
(= 5, = 1)*mn*

benzene
(= 6, = 1)*mn*

Systems containing $4n$ π-electrons (such as cyclobutadiene and the cyclopentadienyl cation) are 'antiaromatic'.

See also: conjugation, Möbius aromaticity

Source:

PAC, 1994, *66*, 1077 *(Glossary of terms used in physical organic chemistry (IUPAC Recommendations 1994))* on page 1122

