

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 $(\text{CH})_m$ 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
($m = 3, n = 0$)



cyclopentadienyl anion
($m = 5, n = 1$)



benzene
($m = 6, n = 1$)

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

See also *conjugation*, *Möbius aromaticity*.
1994, 66, 1122