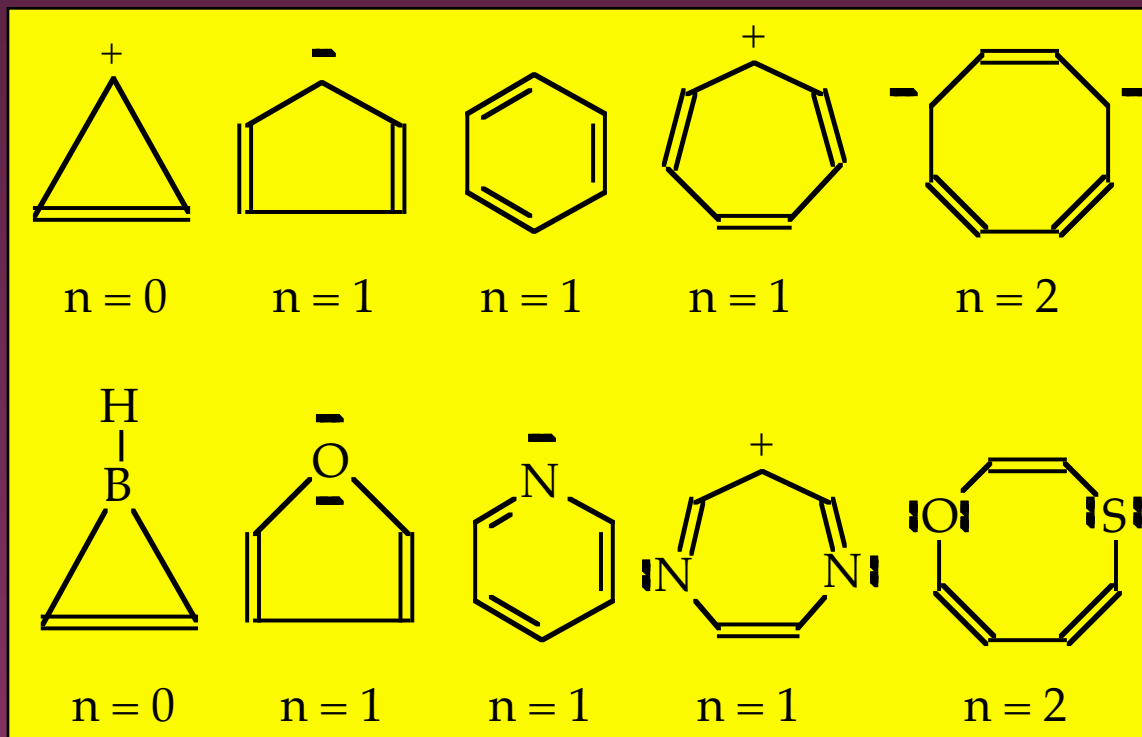


Criteria for Aromaticity

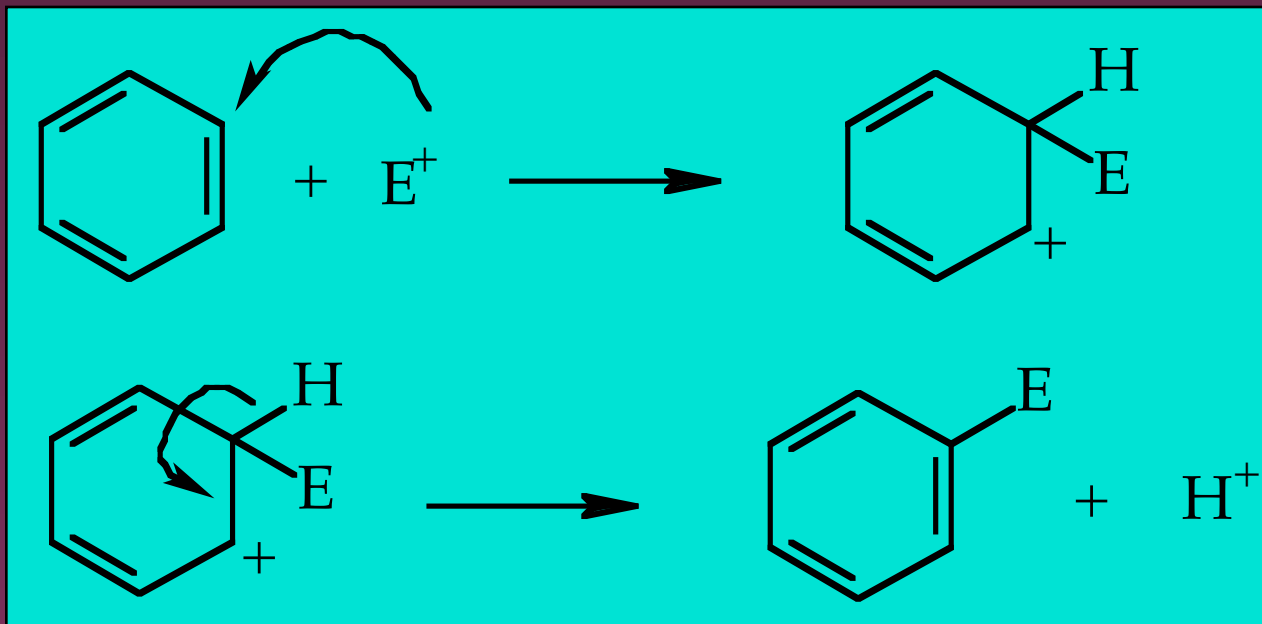
- 1. The system must be cyclic**
- 2. The system must be planar (flat)**
- 3. Each ring atom must be part of a completely extended pi system**
- 4. The completely extended pi system must contain the Hückel # of pi electrons ($4n+2$)**

Examples of Hückel $4n+2$ Systems



$4n+2 = \#$ of pi electrons
such that $n = 0, 1, 2, 3, 4, 5, \dots$ etc.

BASIS FOR ELECTROPHILIC AROMATIC SUBSTITUTION



- Electrophile attack on electron-rich aromatic ring
- Temporary loss of aromatic character
- Loss of proton to restore aromaticity

Electrophilic Aromatic Substitution

- Nitration
- Halogenation
- Friedel-Crafts Alkylation
- Friedel-Crafts Acylation
- Sulfonation