
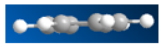





# Aromatic systems

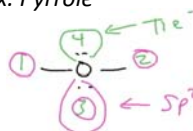
Compound	Structural Formula	Reaction with Br <sub>2</sub>	Thermodynamic Stabilization
Benzene	 	Substitution	Large
Pyridine		Substitution	Large
Furan		Substitution (0 °C)	Moderate
Pyrrole		Substitution	Moderate

► Lone pair electrons in heterocycles :

- lone pair electron does not make fourth group is  $sp^2$  hybridized not  $\pi$  electron : ex. Pyridine
- lone pair electron makes fourth group is  $\pi$  electron; ex. Pyrrole

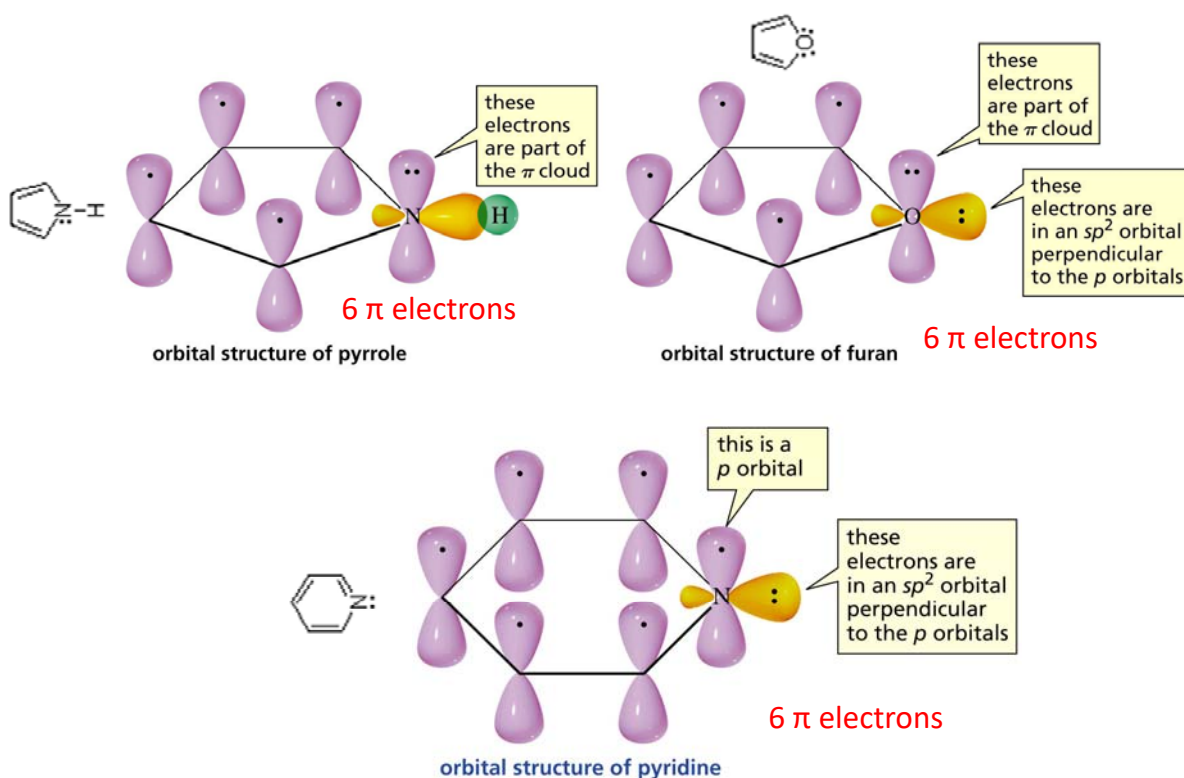
ex. Oxygen in Furan :

1 lone pair electron for  $\pi$  bond,  
and 1 lone pair electron for  $sp^2$  hybridization



Chapter 4 - 5

# Aromatic systems



Chapter 4 - 6