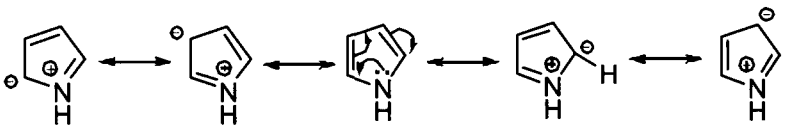
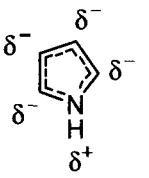
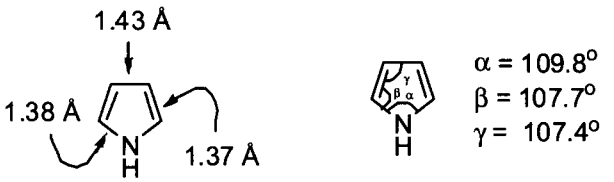


As a consequence, pyrrole has a resonance hybrid that places the partial positive charge on the nitrogen atom and the partial negative charges on the four carbon atoms. For pyrrole, the resonance effect overpowers the inductive effect exerted by the nitrogen atom, whereas the inductive effect for furan and thiophene was a stronger force than their resonance effect.



As far as furan and thiophene are concerned, their resonance effect is not as strong as the inductive effect. Therefore, their dipole moments are in the same direction of pyrrolidine.

Geographically, the pyrrole ring is a plane pentagon, with bond angles and bond lengths almost the same as a regular pentagon:



Pyrrole's Bond Lengths and Angles

For its ^{1}H-NMR (Nuclear Magnetic Resonance Spectroscopy), the two β-protons (Hβ) show up at 6.32 ppm, whereas the two α-protons (Hα) show up at 6.87 ppm, further down field from the two β-protons, because of the inductive effect from the nitrogen atom. As far as the NH is concerned, its chemical shift often is affected by solvents and concentrations for the NMR samples. The coupling constant between Hα and Hβ is 2.6 Hz, whereas the coupling constant between Hβ and Hβ is 3.4 Hz.