## Thermodynamic Studies of Polycyclic Aromatic Compounds

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Available data for heats of combustion and vapor pressures of poly-- cyclic aromatic compounds will be presented and evaluated. Special attention will be directed toward cases where large strain energies are involved and toward heterocyclic systems.

## Electronic Interactions in Paramagnetic Polycyclic Substances

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All odd electron polycyclic substances and some even electron ones are paramagnetic. The paramagnetism permits detailed investigation of electronic interactions by magnetic resonance spectroscopy. The following properties will be discussed: spin distribution, rate of spin migration, spin-spin interactions, and inter-electron correlations.

The phenomena are illustrated by the behavior of hydrocarbon radicals, ketyls, and chelate compounds.

## ESR Examination of the Electronic Distribution in Polycyclic Triplets

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The parameters describing the magnetic dipole interaction of the unpaired electrons in a triplet state are easily obtained using randomly oriented samples. The values of D and E are sensitive measures of an averaged distance between the electrons. In the metastable $\pi$-$\pi^*$ triplets responsible for the phosphorescence of aromatic hydrocarbons, both electrons are delocalized over the $\pi$- system. In many ground state triplets one electron may be effectively localized at one atom and serve as a probe of the density of the other electron at that center. Applications are made to determine the effect of substituents on delocalization in nitrenes and methylenes.