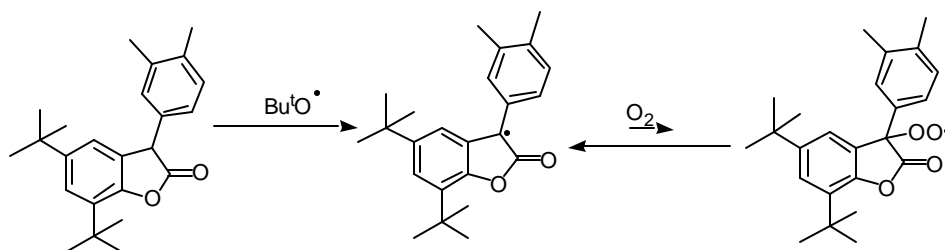


Antioxidant Mediation through Carbon-Centered Radicals

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Many molecules react with oxygen to form peroxy radicals that undergo autooxidation chain reactions. These reactions can be slowed down with antioxidant molecules. Although most known antioxidants form oxygen-centered radicals (such as vitamin E), carbon-centered radical antioxidants are known to exist. HP-136 is an example of an antioxidant that forms a carbon-centered radical:



This project involved an investigation into the properties of carbon-centered antioxidant radicals. Trimethoxy-substituted HP-136, phenyl-4-nitrophthalide and α -angelicalactone were tested for oxygen reactivity through laser flash photolysis.

Laser flash photolysis was also used to determine the hydrogen abstraction rate constant of 3-phenylhydroxycoumaranone. However, the rate constant of most molecules could not be determined through this method, as they absorbed within the laser wavelengths (308nm and 355nm). Thus, thermolysis of hyponitrite and gas chromatography were used to determine the hydrogen abstraction rate constants of 2-indanone, phenyl-substituted indenenes, substituted phenyl-phthalides and trimethoxy-substituted HP-136. These molecules exhibited rate constants between 10^6 and $10^7 \text{ M}^{-1} \text{ s}^{-1}$.