Experimental Study of Oxidation Mechanisms of Large Hydrocarbons by the Photolytic Formation of Key Radical Intermediates

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The aim of this project is to better understand the *detailed chemical mechanisms underlying hydrocarbon oxidation*, by studying molecular products formed from key radical species (RO_2 and RO). Radicals are formed photolytically rather than from oxidant + hydrocarbon reactions, allowing for a high degree of control of reaction pathways and reaction conditions. Using aerosol mass spectrometry, we can study the low-volatility products of radicals in either the gas or the condensed phase.

Below is a mass spectrum of the products of the photolysis of condensed-phase iodooctadecane ($C_{18}H_{27}I$), with products of higher carbon number than the parent. This provides unambiguous evidence of association reactions of organic radicals with other organic molecules or radicals.

