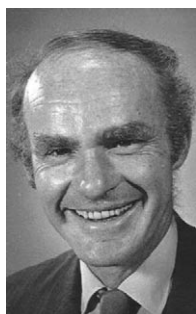


George S. Hammond (1921–2005)

George Simms Hammond, a major figure in the fields of physical organic chemistry and mechanistic photochemistry, passed away on October 5, 2005, at the age of 84.



Hammond was born on a dairy farm outside of Auburn, Maine (USA). He received his BS degree from Bates College

and his PhD from Harvard under the supervision of Paul D. Bartlett, and spent a postdoctoral year with Saul Winstein at UCLA. In 1948, he launched his academic career at Iowa State University, where he investigated the kinetics and mechanisms of many important organic reactions and made a major intellectual contribution to chemistry with the Hammond postulate:^[1] when a high-energy reactive intermediate and transition state occur close to one another on a reaction coordinate, their energies and structures will be very similar. Chemists have found the postulate particularly useful when applied to elementary chemical steps that are either highly exothermic or highly endothermic: in highly exothermic steps the transition state is postulated to resemble the reactants, and in highly endothermic steps the products are postulated to be good models for transition states.

In 1958, Hammond moved to Caltech and published the first of a classic series of papers on mechanistic organic photochemistry.^[2] He convincingly described a mechanism for the photo-reduction of benzophenone by benzhy-drol in which the role of the triplet state was unambiguously established. Hammond also made a major discovery: the ability to produce triplet states through electronic energy transfer.^[3] At that time, the triplet state was a rather gossamer-like species, and Hammond's triplet energy transfer studies eventually put the triplet state on the same mechanistic footing as classical reactive intermediates such as carbocations and free

radicals. Triplet energy transfer was shown to be a means of effecting a range of organic photoreactions such as intra- and intermolecular cycloadditions and *cis-trans* isomerizations. Perhaps of greater importance from his standpoint was the demonstration of the critical role of molecular dynamics in determining photochemical outcomes, as well as the development of methods to measure accurate rate constants for primary photochemical processes and for the deactivation of electronic excited states.

Starting in the late 1960s, in collaborations with Gray's group at Caltech, Hammond applied the lessons of mechanistic organic photochemistry to inorganic and organometallic systems. He worked out the mechanisms of the photoreactions of metal carbonyls,^[4] once again by applying molecular orbital theory to rationalize reaction pathways, and investigated the photochemistry of metal-metal and metal-hydride bonds.^[5,6] Hammond also collaborated on experiments^[7] on rhodium isocyanide complexes that led to the discovery of visible-light-driven photoreactions that store solar energy through the production of high-energy molecules such as hydrogen.

In 1972, Hammond accepted the post of vice-chancellor for natural sciences at the University of California at Santa Cruz. In 1978, he accepted a position as Associate Director of Corporate Research for the Allied Chemical Corporation, where he remained until his retirement in 1988. Following formal retirement from Allied, Hammond returned to teaching and research as an adjunct faculty member at Bowling Green State University, Georgetown University, the University of Hawaii, and Portland State University, where he worked closely with both students and faculty for many years.

Hammond's research style, by his own admission, was "loose". He viewed the mentor-student relationship as a partnership. The student was working *with* the mentor not *for* the mentor. This style proved to be very effective and a model for many of his students who have later filled academic positions in the USA and all over the world.

Hammond was an innovator in chemical education and a gadfly urging serious reflection of the way chemists

taught their discipline and in their attitude of the way chemical research was performed. His textbook with Cram, "*Organic Chemistry*",^[8] totally abandoned the traditional functional group approach to teaching organic chemistry in favor of a mechanistic approach. The book was far ahead of its time and is still a valuable resource for pedagogical approaches to the subject.

Hammond's towering accomplishments were widely recognized by the scientific community. He was elected to the National Academy of Sciences (1963) and the American Academy of Arts and Sciences (1965). He received awards from the American Chemical Society in Petroleum Chemistry (1961), the James Flack Norris Award in Physical Organic Chemistry (1967), the Award in Chemical Education (1972), and the Priestley Medal (1976). He received the National Medal of Science in 1994.

It was a thrill and a great honor for both of us to work with George Hammond. His brilliance, profound chemical insight, and delight in grappling with all things chemical were a wonder to behold. He will be sorely missed, but his legacy continues in the students and colleagues who had the privilege of working with him.

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