This Week's Citation Classic

Hampson R F, Jr. & Garvin D, eds. *Chemical kinetic and photochemical data for modelling atmospheric chemistry.* Washington, DC: US Government Printing Office, June 1975. National Bureau of Standards, Technical Note 866. 118 p. [Physical Chemistry Div., Natl. Bureau of Standards, Washington, DC]

A table of chemical kinetic and photochemical data for gas phase reactions of neutral species is presented. It gives preferred values for reaction rate constants, photoabsorption cross sections, and quantum yields. It provides the basic physical chemical input data needed for modeling atmospheric chemistry. [The *SCI*® indicates that this paper has been cited over 160 times since 1975.]

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"This publication contains an extensive table of chemical kinetic and photochemical data for gas phase reactions of neutral species important in stratospheric chemistry.

"It was the product of a major data compilation and evaluation effort centered within the Physical Chemistry Division of the National Bureau of Standards (NBS) located in Gaithersburg, Maryland, and includes contributions by other evaluators. It was prepared in the Chemical Kinetics Information Center, established in 1963 as part of the National Standard Reference Data System to serve as a central source of information on rates of chemical reactions.

"The objective of this effort was to provide a reliable kinetics data base needed for the solution of an important national problem. In the early-1970s there were suggestions of a potential depletion of the stratospheric ozone layer initiated by the injection of propulsion effluents from proposed high-flying fleets of supersonic transports. The Climatic Impact Assessment Program of the Department of Transportation was established to determine the potential environmental impact of high-flying aircraft and to provide the scientific basis for technical and operational standards for future air travel.

"When this problem arose, I had just joined a data evaluation group directed by David Garvin, who had been directing the activities of the information center and accumulating a data bank for reaction kinetics. We saw this as an opportunity to focus these activities toward the solution of an urgent national problem.

"Our understanding of stratospheric chemistry is based on large-scale models with more than 50 species undergoing some 200 reactions. These models require large amounts of numerical input data including the value of the rate constant for each elementary chemical reaction and the values of the photoabsorption cross section and primary quantum yield for each photochemical process.

"This table provided the kinetics data base needed by the atmospheric modelers and also met the needs of the laboratory measurement community for reliable kinetics data for analysis of experimental results and data reduction.

"The authors listed in *SCI*® as citing this publication are evenly divided between members of the atmospheric modeling community and members of the laboratory measurement community. I think it has been widely cited for several reasons: the data provided are critically evaluated, reliable values; they are provided in a single, convenient, easy-to-use source; and the data base is sufficiently extensive for the analysis of large, complex chemical systems.

"This publication was one output of a continuing kinetics data evaluation program within the present Chemical Kinetics Data Center. Earlier versions of this table had been published, and it has been progressively updated and enlarged in recent publications of the center.[1,2] Another recent source of evaluated kinetics data is the report of the CODATA Task Group on Chemical Kinetics."[3]

1. **Hampson R F, Jr. & Garvin D, eds.** *Reaction rate and photochemical data for atmospheric chemistry—1977.* Washington, DC: US Government Printing Office, May 1978. National Bureau of Standards, Special Publication 513. 111 p.
2. **Hampson R F.** *Chemical kinetic and photochemical data sheets for atmospheric reactions.* Washington, DC: US Government Printing Office, April 1980. Federal Aviation Administration report no. FAA-EE-80-17. 490 p.
3. **Baulch D L, Cox R A, Hampson R F, Jr., Kerr J A, Troe J & Watson R T.** Evaluated kinetics and photochemical data for atmospheric chemistry. *J. Phys. Chem. Ref. Data* 9:295-471, 1980.