This Week's Citation Classic

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Anbar M & Neta P. A compilation of specific bimolecular rate constants for the reactions of hydrated electrons, hydrogen atoms and hydroxyl radicals with inorganic and organic compounds in aqueous solution.
Int. J. Appl. Radiat. Isoton. **18**:493-523, 1967.
[Weizmann Institute of Science & Soreq Nuclear Research Center, Rehovoth, Israel]

This is the first critical compilation of rate data reactions of hydrated electrons, hydrogen atoms, and hydroxyl radicals with hundreds of inorganic and organic stable and transient species in aqueous solutions. The data include the conditions under which the reaction rates have been measured. [The *SCI*® indicates that this paper has been cited over 555 times since 1967.]

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"This is a revised version of a compilation published two years earlier.[1] The two first parts, namely those on hydrated electrons and on hydrogen atoms, have been revised again and published in the National Standard Reference Data Series (NSRDS), National Bureau of Standards.[2,3] The reactions of OH radicals have been updated by L. Dorfman and G.E. Adams.[4] In the final NSRDS versions this compilation covers over 1,400 reactions referred to in over 600 papers, dating from 1957 to 1973.

"This selected list of reaction rates was the first one to give an overview of the whole area of free radical reactions in aqueous systems, radiolytic reactions, in particular. It made it possible to draw correlations on the reactivity and mechanisms of these most elementary chemical species. The hydrate electron is the most elementary reducing species and nucleophile, the hydrogen atom the simplest and best understood free radical, and the OH radical the most reactive oxidizing long-lived species in aqueous systems. This is what must have made this review paper so popular.

"Although over 200 of the rate constants listed have been determined by myself and my collaborators, most of' the data cited have been produced by others. It has been a very difficult task for me to select the 'plausible' rate data when there were conflicting results in the literature. This was especially hard when the rejected data were produced by a personal friend.

"I am gratified that many researchers found these data useful, to judge from the number of citations. As for myself, these data were extremely useful, helping me to understand the mechanisms of reaction of the hydrated electron and those of hydrogen atoms. In fact, I first compiled these rate data for my own re; search and then decided to share them with others. It also made it easier for others to check my conclusions by having at hand all the pertinent data.

"There is, however, a general comment I must make in conjunction with this. The publication of *any* review paper in the scientific literature, as complete and useful as it may be, has an intrinsic injustice built into it. Researchers will cite the handy review rather than the original paper. Thus the original researcher stops getting credit for his contribution. Having been not only the reviewer of these data but also a major contributor, I feel entitled to make this personal comment. In other words, I would have felt better if my colleagues cited the *original* papers they found through my review, even if I would not have been honored to have a 'Citation Classic.'"

1. **Anbar M & Neta P.** Tables of bimolecular rate constants of hydrated electrons, hydrogen atoms and hydroxyl radicals with inorganic and organic compounds. *Int. J. Appl. Radial Isntop.* **16**:227-42. 1965.
2. **Anbar M, Bambenek M & Ross A B.** Selected specific rales of reactions of transients from water in aqueous solution.
Washington, DC: National Standard Reference data Service, National Bureau of Standards No. 43, 1973.
3. **Anbar M, Farhataziz I, & Ross A B.** Selected rates of reactions of transients from water in aqueous solution: 2 Hydrogen atom. **Washington, DC: National Standard Reference Data Sevice. National Bureau of Standards No.** 51, 1975.
4. **Dorlman L & Adams G E.** Reactivity of the hydroxyl radical in aqueous solutions.
Washington, DC: National Standard Reference Data Service. National Bureau of **Standards** No. 46, 1973.