

Bailey P.S. The reactions of ozone with organic compounds. *Chem. Rev.* 58:925-1010, 1958.
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A review of the literature concerning the ozonolysis reaction and other reactions of ozone with organic compounds is presented with particular emphasis on the Criegee mechanism of ozonolysis of olefins and ideas suggested by it for mechanisms of other ozone reactions. [The *SCI*® indicates that this paper has been cited in more than 415 publications.]

A Background for Ozonation Research

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I believe this article has been cited so frequently because, in reviewing the reactions of ozone with organic compounds, it alerted chemists to the significance of the then-new Criegee mechanism of ozonolysis of olefins¹ and used it to suggest mechanisms for the reactions of ozone with other types of organic compounds. Although some of these suggestions were rather crude, and others totally wrong in the light of today's knowledge, they excited the curiosity and interest of investigators all over the world. They also led to a tremendous amount of research which has resulted in a very good understanding of the theory and utilization of the ozonolysis reaction and other reactions of ozone with organic compounds.

It all began about six years after I joined the faculty of the University of Texas at Austin, at the end of World War II. I became dissatisfied with the research I was doing and began to look for something more exciting and of greater significance. About this same time, Rudolph Criegee of the University of Karlsruhe, Germany, pre-

sented his new mechanism for the ozonolysis of olefins¹ at the fall 1951 national meeting of the American Chemical Society, in New York City.² I was so intrigued by Criegee's work that I applied for a Fulbright award and spent the 1953-1954 academic year in his laboratory.

Two papers resulted from my work in Karlsruhe. The first of these³ I wrote in German and handed to Criegee, then editor of *Chemische Berichte*. After trying to read it, he called me to his office and diplomatically suggested that much time would be saved if I rewrote the paper in English and let one of his German coworkers translate it into German.

More importantly, my Karlsruhe sabbatical year allowed me to gain a thorough knowledge of the literature of ozone-organic chemistry and an enthusiasm for the field which resulted in many new and exciting research ideas.

Upon my return to the University of Texas, I began not only to put my new ideas into a research program, which I pursued for 30 years, but also to write the 1958 *Chemical Reviews* article. The article attracted so many new workers into the ozonation field that it soon became obsolete. The new developments that resulted, from organic chemists, physical chemists, and theoreticians, are discussed in two monographs^{4,5} which, after 14 years of starts and stops (due to the pressure of my own research), took me seven years of steady writing to complete. These monographs, in turn, have aroused further interest in the field and have led to more important developments (e.g. references 6 and 7) that undoubtedly will require more monographs to cover. Thus the importance of the 1958 article lies in its generation of a large volume of new knowledge.

1. Criegee R. The course of ozonization of unsaturated compounds. *Rec. Chem. Prog.* 18:111-20, 1957. (Cited 230 times.)

2. -----, The ozonolysis of olefins and acetylenes. *Abstracts of papers of 120th Nat. Meet. Amer. Chem. Soc.*, September 1951, New York, p. 22M.

3. Bailey P.S. Notiz über die ozonisierung von 1,2-diphenylindolen. *Chem. Ber.* 87:993-7, 1954.

4. -----, *Ozonation in organic chemistry. Volume I. Olefinic compounds.* New York: Academic Press, 1978. 272 p. (Cited 180 times.)

5. -----, *Ozonation in organic chemistry. Volume II. Nonolefinic compounds.* New York: Academic Press, 1982. 479 p.

6. Wojciechowski B.J., Pearson W.H. & Kuczkowski R.L. Stereochemical effects in ozonolysis of (E)- and (Z)-1-ethoxypropene. *J. Org. Chem.* 54:115-21, 1989.

7. Griesbaum K., Volpp W., Greinert H.-J., Schmidt J. & Henke H. Ozonolysis of tetrasubstituted ethylenes, cycloolefins and conjugated dienes on polyethylene. *J. Org. Chem.* 54:383-9, 1989.

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