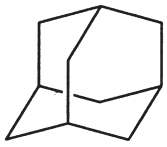
NEKROLOG OBITUARY

Rativoj Seiwerth
(1916 – 2000)

Following a brief illness, Rativoj Seiwerth died quietly at his home in Zagreb on October 29, 2000. He was 84 years old. Born in Osijek on January 28, 1916, he was the last surviving member of Vlado Prelog's Ph.D. students from the period 1935–1941 when the groundwork for research in synthetic organic chemistry was laid at the University of Zagreb, through which it became well known and recognized in the world.

Seiwerth studied chemistry at the Technical Faculty of the University of Zagreb and received his Dipl. Ing. Degree in 1939. He joined Prelog's group as a student and started investigating new synthetic approaches in the field of china alkaloids. His first publications with Prelog appeared in the then most prestigious European chemical journal, the »*Berichte der deutschen Chemischen Gesellschaft*« (*Ber.* now *Chem. Ber.*). Recognizing his skills and excellent knowledge of experimental organic chemistry, Prelog advised his young assistant to choose the challenging problem of synthesizing adamantane for his dissertation (**1**).

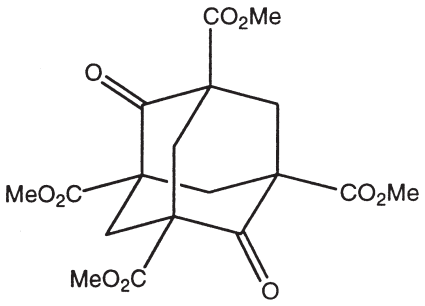


1

This ten-carbon tricyclic hydrocarbon was first isolated in 1933 in Prague by Landa and Machaček from crude petroleum from the Hodonin oil fields. Its structure was intuitively recognized by Rudolf Lukeš, who was at that time Prelog's mentor at the Technical High School in Prague.

The synthesis of this fascinating hydrocarbon, whose carbon frame is embedded in the crystal structure of diamond, was the subject of numerous unsuccessful attempts by contemporary German organic chemists. The closest run toward this goal was the in 1937 published Böttgers synthesis of

1,3,5,7-tetramethoxycarbonyladamantane-2,6-dione (**2**) from the tetramethoxycarbonylbicyclo[3.3.1]nonane-2,6-dione (**3**) previously synthesized by Meerwein and Schürmann.



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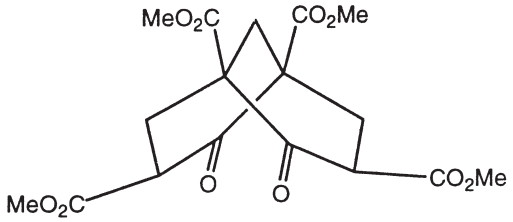
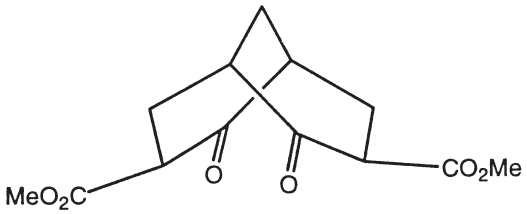


3

Instead of using Meerwein's tetra ester, Seiwerth chose diester (**4**), also prepared by Meerwein, which could be, *via* its disodium derivative, easily condensed with methylene bromide to 1,3-dimethoxycarbonyladamantane-2,6-dione (**5**).



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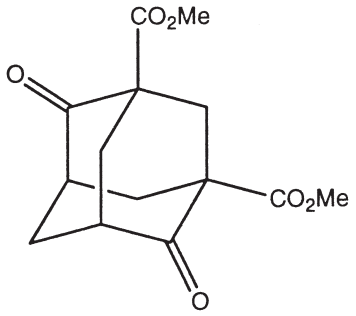

5

After saponification, this could be reduced by the Wolf-Kishner method to the corresponding dicarboxylic acid, which was eventually decarboxylated to adamantane (**1**) with copper bronze at 400 °C with a yield of only 2.4%. This first successful synthesis was published in the October 1937 issue of *Berichte*, followed after only one month by the publication of an improved synthesis with slightly better yields. This enabled preparation of more adamantane, which was in every aspect identical with the hydrocarbon isolated from petroleum. The described synthesis is an example of classical

methods of synthetic organic chemistry practised in the first half of the 20th century when identification was mostly done by elemental (micro) analysis and mixed melting point determination. The synthesis of adamantane was the crown achievement of Prelog's school of organic chemistry in Zagreb and it came as no surprise that Prelog, before leaving for Switzerland in December 1941, chose Seiwerth as his successor to the chair of organic chemistry. Thus, at the age of 26, he became the youngest docent of chemistry at the Technical Faculty of the University of Zagreb. Here, during the turbulent war years, he proved himself as an esteemed teacher of the next generation of organic chemists, including the author of this obituary, thus continuing the tradition of his great master.

The saga of adamantane and the Prelog-Seiwerth synthesis was appropriately remembered in the quotation from a poem written by Christopher Mislow (son of Princeton's Kurt Mislow) and published on the occasion of Prelog's 80th birthday:

»At Zagreb his work was frenetic
To make adamantane synthetic
A molecular cathedral
Of shape tetrahedral«.

After Paul Schleyer's revolutionary one step synthesis of adamantane, reported in 1957, this compound became available for further studies, which are continuing to these days. Schleyer's postdoctoral and my former graduate student, Zdenko Majerski, after returning to Zagreb from Princeton, instigated research in this highly specialized field of organic chemistry by new and original contributions that, after his death, were successfully propagated by his wife Kata, his students and former collaborators. Thus, the groundbreaking work of Prelog and Seiwerth of 60 years ago is still a source of inspiration for our organic chemists.

The political changes in former Yugoslavia, with the establishment of the communist regime in 1945, brought an early end to Seiwerth's academic career, but fortunately not to his professional activities as chemist. After serving for a brief period as research associate and technical manager with the Croatian Institute for Industrial Research, he became in 1952 director of the newly established Research Institute of the »Pliva« Pharmaceutical Company. In this capacity, which lasted until his retirement in 1980, he participated in some 30 inventions in the field of pharmaceutical chemistry, numerous patents and over 60 publications. He contributed to the development of synthetic methods and alternative routes to the synthesis of sulfonamides, antirheumatic drugs, diuretics, tetracyline antibiotics and semisynthetic penicillins. He was a corresponding member of the Croatian Academy of Sciences and Arts, honorary Professor of the University of

Zagreb, member of the Croatian Chemical Society, and recipient of the City of Zagreb award. Rativoj Seiwerth was a kind person and a true professional of a quiet determination and great technical skill. He will be missed and remembered by his family and friends as well as by his former colleagues.

Dionis Sunko