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Henry Selig – Obituary*



Professor Henry Selig, a dear friend and colleague, passed away peacefully October 21, 2014, a few months after his 87th birthday. He was preceded in death by his beloved wife Hassida and is survived by his three daughters and grandchildren. He was a pioneer in inorganic fluorine chemistry, especially in Xenon fluorides. Until his death he retained the same warm, welcoming lucid personality. One of us (GVR) knew Henry since 1976 where he met with him first in the laboratory of Professor Schmutzler at the Technical University Braunschweig (Germany) who also sadly passed away this year. Over the years we regularly met at International and European Fluorine Symposia, moreover at the ACS Winter Fluorine Conferences in Florida and, of course, in Israel where we luckily could celebrate his last birthday together.

Henry Selig comes from a far seeing family and were able to flee Frankfurt (Germany), where he was born 1927, just in time – in 1939. As many others they found in the USA a new home where Henry, in 1949 earned a B.Sc. in mathematics at the University of Chicago. He continued to his PhD, which was devoted to nuclear chemistry, at what is now known as the Carnegie-Mellon University. In 1953 he took up a position at the Argonne National Laboratories (ANL) where he worked on a classified project for seven years. Being blessed with curious nature, however, he established an additional research line of his own and so he tried to measure the half-life of the nuclide Re^{187} which was presumed to be radioactive with a very long half-life. Because of the low energy of the β -radiation emitted by Re^{187} it was necessary to measure the activity in the gaseous state and one of the few volatile compounds of rhenium reported in the literature

was $\text{Re}(\text{CH}_3)_3$. As it turned out, this compound did not exist and so Selig tried to prepare the volatile ReF_6 . Instead, this collaboration with Sherman Fried and John Malm resulted in the synthesis of the unknown ReF_7 . Thus, inadvertently had begun the career of Selig as a fluorine chemist. At this point he was able to leave the classified project and devoted himself fully to fluorine chemistry. In the course of time Selig in collaboration with ANL colleagues synthesized the previously unknown compounds TcF_6 and RuF_6 as well as pure ReF_6 . Further, Selig and coworkers devoted themselves to studying the properties of these hexafluorides as well as other transition metal fluorides with emphasis on the use of vibrational spectroscopy. Another phenomenal discovery of Selig together with his colleagues Howard Claassen and John Malm was the synthesis of XeF_4 . This followed the sensational oxidation of xenon by PtF_6 by Neil Bartlett which has been labeled as one of the major chemical discoveries of the 20th century. Selig and coworkers continued research in the chemistry of the noble gases and synthesized salt-like compounds containing until then unknown moieties KrF^+ , XeOF_3^+ , XeOF_5^- , XeF_5^+ , XeF_7^- and XeF_8^{2-} .

Before immigrating to Israel he received the Israel A.E.C. fellowship at The Hebrew University of Jerusalem, where he became Visiting Professor at the Department of Inorganic & Analytical Chemistry shortly after the Six-Day War and was appointed Professor of Chemistry in 1968. In this position he continued his studies in fluorine chemistry emphasizing reactions in anhydrous HF and synthesizing a number of compounds including new oxonium salts. In addition he investigated the impact of fluorine chemistry on some of the so-called synthetic metals such as graphite intercalation compounds and doped polyacetylenes. These compounds exhibited remarkably enhanced electrical conductivities. Of note is the synthesis of the graphite intercalation compound C_8AsF_5 whose electrical conductivity per weight exceeded that of copper. This discovery helped instigate a new series of symposia called Symposia on Graphite Intercalation Compounds. One of these symposia convened in Jerusalem in 1987 as well as the Eighth European Fluorine symposium hosted by Selig and coworkers in Jerusalem in 1983, where he succeeded in being a perfect mediator between Northern American, European and Israeli Scientists. Moreover, he encouraged and promoted contacts of younger German chemists with their Israeli counterparts. He played a key role in building up friendly and persisting connections towards the Slovenian fluorine chemistry group in Ljubljana (Slovenia).

In addition, Henry Selig studied the reactions and intercalation of fluorine compounds with graphite fibers. The results promise practical applications in the study of certain composite materials. One other research project of interest was the fluorination of the then newly discovered Buckminsterfullerenes of which the prototype is C_{60} , in pursuit of the elusive fully fluorinated $\text{C}_{60}\text{F}_{60}$. While this compound was found to be fleeting species in mass spectroscopy it was impossible to isolate it in macro quantities.

As Summer Visiting Scientist he performed research in scientifically leading institutions, at Argonne National Laboratory, at the Nuclear Research Center Jülich, Germany, at Bell Laboratories, Murray Hill, NJ, at the University of Pennsylvania, Philadelphia, NJ, at the University of Leicester, England. For one year, 1988–1989 he was Visiting Professor at the ETH, Zürich, Switzerland. In 1970–1971 he was Acting Head, 1973–1976 and 1978–1981 Head of the Department of Inorganic & Analytical Chemistry, The Hebrew University of Jerusalem. After long years of service to his university and the international scientific community he became Professor Emeritus in 1995, but continued to work in fluorine chemistry mainly in collaboration with Hebrew University colleagues.

Prof. Karl Christe, Loker Professor of Chemistry at the University of Southern California said that he has known Selig for 40 years and has followed his work very closely. According to him “he is one of the most underrated scientists and the most underrated fluorine chemist he knows. For his entire career, he has carried out brilliant research in fluorine chemistry but, due to his unassuming and humble personality, he has never received the public recognition which he deserves”. In 2009 Selig was awarded the American Chemical Society

Award for Creative Work in Fluorine Chemistry. Most of his life Prof. *Henry Selig* was active in inorganic fluorine chemistry and material science. He owes our respect for not giving up working despite a serious accident and a major surgery.

* In part taken from Shlomo Rozen's laudation from Journal of Fluorine Chemistry 130 (2009) 770.

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