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Department of Chemistry Kolthoff Lectureship in Chemistry

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Faculty Host: Professor Kenneth Leopold

Barbara Finlayson-Pitts is professor of chemistry at the University of California, Irvine. She did her undergraduate degree at Trent University in Canada, and her master's and doctorate at University of California-Riverside. She joined the faculty in the Department of Chemistry and Biochemistry at Cal State Fullerton in 1974, and in 1994 moved to UC Irvine. Her research focuses on experimental studies of reactions that occur in the atmosphere, particularly those between gases and particles such as sea salt, and/or thin water films on surfaces such as buildings, vegetation, etc. In addition, mechanisms of formation and growth of particles in the atmosphere are of interest. Finlayson-Pitts is author or coauthor of more than 160 scientific publications and two books on atmospheric chemistry. She has mentored many students from undergraduates to graduate students, as well as postdoctoral fellows who have gone on to pursue a wide variety of careers. Professor Finlayson-Pitts' research and teaching have been recognized by a number of awards, including the 2004 American Chemistry Society Award for Creative Advances in Environmental Science & Technology, election as a Fellow of the American Association for the Advancement of Science, the American Geophysical Union, and the Royal Society of Chemistry, and election to the American Academy of Arts & Sciences and the National Academy of Sciences.



Lecture 3: *Atmospheric Reactions of Neonicotinoid Pesticides: Detoxification or Activation?* 3:45 p.m. Friday, October 9, 2015 331 Smith Hall

Neonicotinoids were introduced in the early 1990s to control a number of sucking insect pests such as aphids, whiteflies and thrips. They are extensively used as seed coatings, and interestingly, also for flea control in dogs. Their advantage has been lower toxicity to animals compared to many of the pesticides such as organophosphates and carbamates in use at the time. Their introduction has been associated with environmental impacts such as bee colony collapse and a decrease in insect-eating birds. As a result, the use of some of the neonicotinoids has been highly restricted in Europe. One question is whether the reduced toxicity of neonicotinoids is maintained when they are exposed to the atmosphere; i.e., whether they oxidize or photolyze and if so, whether this changes the toxicity. The results of some studies in this laboratory of the chemistry and photochemistry of the neonicotinoids under atmospheric conditions will be presented, with implications for their impacts.

Izaak Maurits Kolthoff was born on February 11, 1894, in Almelo, Holland. He died on March 4, 1993, in St. Paul, Minnesota. In 1911, he entered the University of Utrecht, Holland. He published his first paper on acid titrations in 1915. On the basis of his world-renowned reputation, he was invited to join the faculty of the University of Minnesota's Department of Chemistry in 1927. By the time of his retirement from the University in 1962, he had published approximately 800 papers. He continued to publish approximately 150 more papers until his health failed. His research, covering approximately a dozen areas of chemistry, was recognized by many medals and memberships in learned societies throughout the world, including the National Academy of Sciences and the Nichols Medal of the American Chemical Society. Best known to the general public is his work on synthetic rubber. During World War II, the government established a comprehensive research program at major industrial companies and several universities, including Minnesota. Kolthoff quickly assembled a large research group and made major contributions to the program. Many of Kolthoff's graduate students went on to successful careers in industry and academic life and, in turn, trained many more. In 1982, it was estimated that approximately 1,100 doctorate holders could trace their scientific roots to Kolthoff. When the American Chemical Society inaugurated an award for excellence in 1983, he was the first recipient.

