UNIVERSITY OF MINNESOTA
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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 2:
Particles in Air:
What Can Be So Complicated?
9:45 a.m. Thursday, October 8, 2015
331 Smith Hall

The atmosphere is a very complex mixture of gases, solids and liquids containing thousands of organic and inorganic compounds. Understanding and quantifying this complexity is critical for elucidating the impact of anthropogenic emissions on visibility, health and climate. A particularly challenging problem involves airborne particles. While there are direct, primary sources of particles such as soot from diesel engines, sea salt generated by wave action and wind-blown dust, much of the particulate matter in air is secondary. That is, particles are formed by reactions of precursor gases that generate low volatility products which either form new particles or add to existing particles in air to grow them. Some recent studies in our lab on how particles are initially formed from the oxidation of organic precursors in air, and how particles grow to sizes important for light scattering, inhalation and climate change will be presented. The critical need for molecular level understanding of these processes will be highlighted in the context of what we really need to know in the future to predict their impacts on air quality and climate. This chemistry also illustrates how biogenic and anthropogenic emissions can act synergistically, a challenge when developing cost-effective control strategies.

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.