

CHEMICAL HERITAGE FOUNDATION

ALLAN S. HAY

Transcript of an Interview
Conducted by

Leonard W. Fine and George Wise

at

Schenectady, New York

on

24 July 1986

(With Subsequent Additions and Corrections)

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ALLAN S. HAY

1929 Born in Edmonton, Alberta on 23 July

Education

1950 B.Sc., chemistry, University of Alberta
1952 M.Sc., chemistry, University of Alberta
1955 Ph.D., chemistry, University of Illinois

Professional Experience

1950-1952 Instructor, University of Alberta

General Electric Company

1955-1968 Research Chemist
1968-1980 Manager, Chemical Laboratory, Research and
Development Center

1980- Research and Development Manager, Chemical Science
and Engineering

1975- Adjunct Professor, Polymer Science and Engineering
Department, University of Massachusetts

Honors

1970 Fellow of the New York Academy of Sciences
1975 International Award in Plastics Science and
Engineering, Society of Plastics Engineers
1977 Rauscher Memorial Lecturer, Society of Plastics
Engineers
1981 Fellow of the Royal Society of London
1984 Achievement Award, Industrial Research Institute
1985 Carothers Award
1985 Chemical Pioneer Award, American Institute of
Chemists

ABSTRACT

Allan S. Hay begins the interview with a description of his secondary and undergraduate education in Alberta. After briefly describing his graduate work at the University of Illinois and a summer job at Du Pont, he begins the story of his career at General Electric. There, after only a very short time, he was able to oxidize xylene to synthesize PPO. Hay focuses on the practical applications as well as the chemical aspects of the progress that occurred in plastics research (including the developments of Noryl and Ultem) during his career as both a research chemist and a manager at G.E. He concludes with a bit of insight into what lies ahead in polymer research and development.

INTERVIEWERS

Leonard Fine is Professor of Chemistry and Director of Undergraduate Studies in Chemistry at Columbia University. His special interests include polymer chemistry and materials science, industrial inorganic and organic chemistry, engineering plastics, problems in solid waste management and the recovery and recycling of post-consumer plastics. Among his recent publications are two practical manuals on principles and practices of infrared spectroscopy and a general chemistry textbook for engineers and scientists. He holds a B.S. in chemistry from Marietta College and a Ph.D. in chemistry from the University of Maryland at College Park.

George Wise is a communications specialist at the General Electric Research and Development Center in Schenectady, New York. He holds a B.S. in engineering physics from Lehigh University, an M.S. in physics from University of Michigan, and a Ph.D. in history from Boston University. He worked briefly as a systems engineer before entering his current career in public relations. He has published a book and several articles about the history of industrial research, invention and science. His current research interest is how people can learn from history.

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- 1 Family and Education
Interest in chemistry begins during secondary school in Alberta, where advanced courses are available. Attends the University of Alberta and becomes interested in organic chemistry and is mentored by Reuben B. Sandin. On Sandin's recommendation, pursues graduate work at the University of Illinois. Introduced to industrial chemistry through summer employment at Du Pont.

- 11 Research Chemist at General Electric
Recruited from Illinois by John Elliott. Given tremendous freedom and independence. Works on oxidation of xylenes and with phthalic acids. Misses out on patent opportunity. Research on oxidation of phenols and xylenol leads to synthesis of PPO. Controversy in Pittsfield over whether any resources should be shifted from polycarbonates to PPO. Attempts to synthesize completely aromatic polymer lead to polymerization of cyclohexanone (P30). PPO plant built, but manufactured products not successful. Discovery that PPO and polystyrene are miscible leads to rubber toughened blend--Noryl.

- 38 Manager at General Electric
Discovery of polyformals. Interaction with academia. Various consultants. Lack of presence of polymers in most college chemistry curricula. Development of Ultem. Very little interaction with corporate competitors. Currently trying to develop high performance composites for military applications and sports equipment. Maintains identity as organic chemist, not merely polymer specialist.

NOTES

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2. R. B. Sandin and A. S. Hay, "Stable Bromonium and Chloronium Salts," Journal of the American Chemical Society, 74 (1952): 274-275; R. B. Sandin, R. Melby, A. S. Hay, R. N. Jones, E. C. Miller and J. A. Miller, "Ultraviolet Spectra and Carcinogenic Activities of Some Fluorene and Biphenyl Derivatives," ibid.: 5073-5075.
3. R. C. Fuson and H. R. Snyder, Organic Chemistry (New York: Wiley, 1942).
4. A. S. Hay, H. S. Blanchard, G. F. Endres and J. W. Eustance, "Polymerization by Oxidative Coupling," Journal of the American Chemical Society, 81 (1959): 6335-6336.
5. A. S. Hay, "Polymerization by Oxidative Coupling. II. Oxidation of 2,6-Disubstituted Phenols," Journal of Polymer Science, 58 (1962): 581-591.
6. G. F. Endres and J. Kwiatek, "Polymerization by Oxidative Coupling. III. Mechanistic Type in the Copper-Amine Catalyzed Polymerization of 2,6-dimethylphenol," Journal of Polymer Science, 58 (1962): 593-609.
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