

Meetings



Hastert



Allen



Albright



Carr



Mounts



Okonek

Hydrogenation speakers

Hydrogenation, one of the key unit processes in fats and oils refining, will be thoroughly reviewed in a unique colloquium to be held May 11 and 12 at the Turtle Bay Hilton Hotel, Oahu, Hawaii, under sponsorship of the American Oil Chemists' Society.

Colloquium organizer Robert Hastert has invited internationally known specialists to describe and discuss theoretical as well as practical aspects of hydrogenation. The goal is to enable participants to better understand, and consequently to improve, their hydrogenation operations. The meeting will cover chemistry, theory of catalysis and reaction orders and rates, effect of process conditions, and effect of feedstock impurities on preferential selectivity and degree of isomerization.

The colloquium will open at 8:30 a.m. on Sunday, May 11, with a welcome and faculty introductions.

The first topic to be covered will be the theory of hydrogenation. Session chairman will be Timothy L. Mounts, leader of vegetable oil research at the USDA Northern Regional Research Center. The author of more than 85 scientific publications, Mounts was a 1985 recipient of the Chevreul Medal from the French oil processors association and served as program cochairman for the recent World Conference on Emerging Technologies in the Fats and Oils Industries.

Robert Allen and Lyle Albright will present the opening lectures on theory. Allen retired a few years ago as principal scientist at the W.L. Clayton Research Center of Anderson Clayton Foods. He has pub-

lished approximately three dozen technical papers on hydrogenation. His 1950s publications elucidated the mechanisms of hydrogenation of monoenes and dienes and were the first to show the diene system was partially conjugated before hydrogenation. Regarded as one of the world's foremost authorities on hydrogenation of edible oils, he recently was named 1986 recipient of the Supelco AOCS Research Award. Albright, a professor of chemical engineering at Purdue University, has published more than 160 scientific papers, including 20 papers since 1957 relating to hydrogenation and reductions. He is a fellow and former director of the American Institute of Chemical Engineers. He has experience as a chemical engineer for the Du Pont and Colgate-Palmolive organizations and has served as a hydrogenation consultant to numerous firms.

Their lectures will cover basic theory, preferential selectivity, *trans*-isomerisms, conjugation and similar topics. After the lectures, there will be 60 to 90 minutes for discussions and questions.

On Sunday afternoon, May 11, the topic will be catalyst performance characteristics. Six faculty members will present brief (15- to 20-minute) lectures, followed by another discussion session. Nickel catalysts will be discussed by Allen, Albright and H. B. W. Patterson. Patterson, from Bebington, England, has become a consultant after more than 40 years with Unilever, where his responsibilities included several large processing plants, particularly in edible oil refining and hydrogenation. He has recently visited Asia and Africa on behalf of the Food and Agricultural Organization (FAO) and the United Nations Industrial Development Organization (UNIDO). He is the

author of "Hydrogenation of Fats and Oils," published by Applied Science in 1983. Mounts will discuss catalysts other than nickel. Douglas Okonek will discuss sulfur-promoted catalysts. Okonek is section head for technical service in the catalyst department at Harshaw/Filtrol Partnership. He has over 13 years' experience in the areas of preparation, testing, analysis and applications of heterogeneous catalysts, especially catalysts for the hydrogenation of edible oils. He has served on various technical committees related to oil hydrogenation and catalysis. Roy Carr, president of the POS Pilot Plant Corp. in Saskatoon, Saskatchewan, Canada, will discuss effects of feedstock impurities. Carr has extensive background in processing edible oils with companies such as Procter & Gamble, Hunt-Wesson Foods and Canbra Foods in the United States and Canada. He is chairman for a 1986 AOCS-POS short course on edible oil processing and has served as a speaker at previous AOCS short courses and on organizing committees for world conferences.

The Harshaw/Filtrol Partnership will host a reception for registrants on Sunday evening, May 11, before the dinner that is included in the colloquium fee. After the dinner, E. G. Hunter of Procter and Gamble will speak on the nutritional aspects of hydrogenation. Hunter is a nutritionist in the food product development division at P&G.

There will be two sessions on Monday morning, May 12. The first will be on the converter, with Albright as chairman. Patterson will discuss converter design and operation. James Oldshue, vice-president for mixing technology at Mixing Equipment Co. in Rochester, New York, will discuss

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Oldshue



Patterson



Smallwood



Young

mixing theory and agitator design. A past president of the American Institute of Chemical Engineers, Oldshue has given seminars and chaired symposia in Europe, Australia, Asia, South America and Africa. He is a member of the U.S. National Academy of Engineering. In December, Oldshue was honored by the American Association of Engineering Societies for his work as chairman of its board of directors. As with all other sessions, approximately 60 to 90 minutes will be available for questions and discussion after the lectures.

The second Monday morning session will be on formulation, with Carr serving as chairman. There will be two lectures, one on single feedstock situations and another on multifeedstock situations. The lat-

ter will be presented by Vernon Young, who has been a consultant on fats and oils technology since 1978. Prior to that he had 25 years' experience with an edible oil refiner, including work as refinery and hydrogenation manager, development manager, production manager, and chief chemist and technical manager. As of mid-January, the lecturer for the single feedstock situation presented had not been formally confirmed.

On Monday afternoon, the topic will be hardening plant design and operation, with Patterson as chairman. Norman Smallwood of The Core Team will describe the design and operation of the most high technology hardening plant that could be built using current knowledge. Registrants will be encour-

aged to ask questions or make comments during the presentation. Smallwood recently founded the management consulting group which specializes in improving productivity by using computer-based process control and developing high-performance operating teams. He worked in the fats and oils industry with Procter & Gamble, Hunt-Wesson Foods, Lou Ana Foods and A.E. Staley Manufacturing, serving as the plant manager for the computerized oil refinery Staley built in Des Moines, Iowa.

The colloquium is scheduled to conclude about 4:30 p.m. after summary comments by Hastert.

Persons interested in attending may use the registration form bound into this issue of *JAACS*. Additional forms, if needed, may be ordered from the Meetings Manager, AOCS, 508 S. Sixth St., Champaign, IL 61820 USA (telephone: 217-359-2344). The colloquium is being held before the joint annual meeting of the AOCS and the Japan Oil Chemists' Society, which will be May 14-18, 1986, at the Hilton Hawaiian Village in Honolulu.

Course contents

A key portion of the AOCS short course on Physical Chemistry of Lipids will be a session on polymorphism of fats.

The short course will be held May 12-14, 1986, at the Turtle Bay Hilton Hotel, Oahu, Hawaii, with David Holcomb of Kraft Inc. R&D as chairman, and Niels Krog of Grindsted Products A/S and Kiyotaka Sato of Hiroshima University as cochairmen.

David Min of Ohio State University will open the session on polymorphism with an overview paper. Min will describe the principles, physical and chemical properties of different polymorphic forms of fats, criteria for major classification of triglyceride polymorphic forms and the applications of polymorphism in shortening, margarine and confectionery fats.

Dr. Sato then will present a paper on "Crystallization Behavior of

Polymorphs of Fats and Fatty Acids." "The main features of fat crystallization may be characterized partly by what are common to the long-chain compounds, and more specifically by the polymorphism," Dr. Sato's abstract says. "Since the differences in the crystal free energies of the multiple polymorphs are rather small, the polymorph-dependent crystallization processes are sensitively affected by driving forces, mediums, temperatures, etc. In addition the solid-state transformations between the polymorphs make the phenomena more complicated: the crystallization and transformation processes often simultaneously occur in a conflicting way at given conditions. A better understanding of those crystallization processes has developed with increasing knowledge of the thermodynamic and crystallography of the polymorphs, and also with the crystal growth theory applied to

this field. Recent studies on the crystallization of the fats and fatty acids will be presented."

Jens Birk Lauridsen of Grindsted A/S in Denmark will follow with a presentation on "Chemical Structure and Polymorphism of Surface-active Lipids." His abstract: "According to available market surveys, the annual use of food grade surfactants derived from fats and fatty acids is 150,000 to 200,000 tons on a worldwide basis. Of the total use, the mono-diglycerides and distilled monoglycerides of animal and vegetable fats amount to about 70% and they are the most commonly used surface active lipids in food systems. This paper describes how mono-diglycerides, distilled monoglycerides and their derivatives with organic hydroxy-acids are produced. Esters of fatty acids and polyols like propylene glycol, sorbitol/sorbitan and polyglycerol are also dealt with. The chemical composition of these

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surfactants is discussed on the basis of modern GLC and HPLC methods combined with other chemical analysis. The physical properties like crystallization and polymorphic behavior are demonstrated by DTA and X-ray diffraction analysis, and the relationship between chemical structure and polymorphic behavior is discussed."

Masamichi Kobayashi, professor of polymer science at Osaka University, will then speak on "Modern Spectroscopic Methods in the Study of Polymorphs and Polytypes of Fats, Fatty Acids and Related Compounds." His paper will include characterization of polymorphic and polytypic structures, thermodynamic and mechanical behaviors deduced from vibrational spectroscopic methods, microstructures in crystalline solids studied by the Raman microprobe technique, molecular motions and conformation disordering occurring in solid state, and solid-state phase transitions of various types.

Other scheduled talks in the polymorphism of fats section are Dr. Garti of the University of Jerusalem on "Surfactant Addi-

tives in Confectionery Fats," Wolfgang Buchheim of the Institut für Chemie und Physik der Bundesanstalt für Milchwissenschaft in Germany on "Ultrastructural Characterization of Interfacial Layers in Oils-in-Water Emulsions," and J.W. Hagemann of the USDA Northern Regional Research Center on "Computer Modeling of Polymorphic Phase Transitions in Triglycerides."

The first day of the short course will focus on methods and concepts. Scheduled speakers include John de Man of the University of Guelph, Canada, on "Physical Properties of Fats and Oils: An Overview"; Marvin Tung of the University of British Columbia on "Rheological Principles with Applications to Fats and Oils"; Philip Sherman of Queen Elizabeth College, London, England, on "Newer Methods for Evaluating Viscoelastic Properties of Fat Systems (Emulsions)"; W. R. Crossman of Kraft Inc. on "Principles of NMR with Applications to Fats and Oils"; Peter J. Wan of Anderson Clayton Foods on "Principles of DSC with Applications to Fats and Oils"; W. Buchheim on

"Microscopy of Fats and Oils Including TEM and SEM," and Kare Larsson of the University of Lund on "X-Ray Diffraction Analysis of Fats and Other Lipids."

The concluding session on interactions of fats and oils with other food components will feature talks by N. Krog on "Interaction of Surface-Active Lipids with Water, Protein and Starch Components in Food Systems"; P. Sherman on "Interaction of Glycerides with Proteins at Interfaces in Emulsions"; K. Larsson on "Lipid-Protein Interactions," and a summary by the chairman and cochairmen, Holcomb, Krog and Sato.

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