

Extraction with supercritical gases in Germany

The following report from Germany was provided by JAOCS International Correspondent H.K. Mangold, director of the Federal Center for Lipid Research in Münster, West Germany.

Many organic compounds can be extracted from "dry" plant or animal tissues by means of liquid or supercritical gases. The material extracted can be recovered by reducing the pressure at constant temperature or by raising the temperature at constant pressure. A recent monograph describes the principle of the new method—destruction—and some of its applications. (*Extraction with Supercritical Gases*, edited by G.M. Schneider, E. Stahl and G. Wilke, Verlag Chemie, Weinheim, Deerfield Beach, Basel, 1980).

Destruction with carbon dioxide is being used on an industrial scale for the decaffeination of coffee (K. Zosel, German Patent 2,005,293 [1970]). Numerous other applications in natural products chemistry and food technology are described in a series of patents by O.G. Vitzthum and P. Hubert, 1972-75.

Vegetable oils can be deconstructed from crushed seeds with supercritical carbon dioxide. The yields obtained depend on the pressure and the temperature employed as well as the size and physical structure of the seed particles. The principle of the equipment used, as shown in Figure 1, is simple.

Gaseous carbon dioxide is condensed in a diaphragm compressor, C, to a pressure of 350 bar, p_1 . The liquid or supercritical carbon dioxide flows through an extraction vessel, E, containing crushed seeds. The deconstructed oil is recovered from its solution by lowering the pressure in two stages, in a first trap, S1, to about 200 bar, p_2 , and in a second trap, S2, to 30-60 bar, p_3 , that is, below the critical pressure of carbon dioxide. The gas released is again condensed in C, thus closing the cycle.

A recent publication describes applications of the method, on a laboratory scale, to soybeans, sunflower seeds and rapeseeds (E. Stahl, E. Schütz and H.K. Mangold,

J. Agric. Food Chem., in press). Work on cottonseed, peanuts and lupines is in progress.

In contrast to organic solvents, carbon dioxide can be removed easily from the oils produced. Moreover, destruction of oils with carbon dioxide at ambient temperatures is of great advantage if the seed proteins are to be recovered because their denaturation is kept at minimum. Last, but not least, carbon dioxide is available on an unlimited scale from renewable organic resources and from inorganic material including various minerals.

Liquid ammonia proved to be an excellent solvent for lipids. Solutions of ammonia in methanol are being used, on a pilot plant scale, for the simultaneous extraction of lipids and nucleic acids from *Methylomonas clara*. The remaining "single cell protein" is suitable as a supplement to animal feed (M. Schlingmann and P. Präve, *Fette Seifen Anstrichm.* 80:283 [1978]). The use of liquid ammonia in food technology is described in several recent patents.

Chromatography with Supercritical Gases

Almost 20 years ago, it was shown that supercritical chloroform can be used as mobile phase for the chromatographic separation of porphyrins (E. Klesper, A.H. Corwin and D.A. Turner, *J. Org. Chem.* 27:700 [1962]). Supercritical carbon dioxide and liquid ammonia also are suitable as solvents. Chromatography with supercritical fluids (SCF) unites the features of both gas chromatography and liquid chromatography. The method is of particular interest for the separation of compounds of high molecular weights. Some applications are described in the aforementioned book and in a recent review article (U. van Wasen, I. Swaid and G.M. Schneider, *Angew. Chem.* 92: 585 [1980]). □

Italian detergent proceedings available

The following report from Italy was provided by JAOCS International Correspondent Prof. E. Fedeli, who is also secretary for the Italian Society for Fats and Oils Research, Via Giuseppe Colombo 79, 20133 Milan, Italy.

Proceedings are now available for the "Detergent and Tensioactive Products Evolution" meeting held during December 1979 under the sponsorship of the Italian Committee for Tensioactive Derivatives. The proceedings may be ordered through the committee, via G. Colombo, 79, 20133 Milan, Italy.

Topics included relationship between structure and biodegradability, recommendations on use of tensioactive materials and the role of phosphorous in water pollution. One purpose of the committee is to coordinate collaborative studies in this area.

The Italian Society for Fats and Oils Research (Societa Italiana per lo Studio delle Sostanze Grasse) has helped

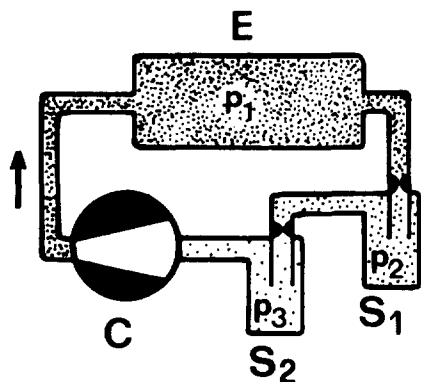


FIG. 1.

organize or has participated in several meetings during the past year. The first was the symposium on fatty materials held during September 1979 at the University of Vienna. This was followed by a discussion on the use of oilseed proteins in Perugia on May 30-June 2, part of a meeting on new foods, and a meeting Oct. 25-26, 1979, on the "Chemical and Nutritional Consequences of Fat Frying."

The next meeting was a symposium on biochemical problems of lipids in Milan on May 26-28, 1980, immediately preceding a meeting on "Drugs Affecting Lipid Metabolism" at the University of Milan. In June 1980, there was a meeting in Rome on the use of olive oil in dietetic preparations. A two-day meeting on hydrogenation of oils was held Sept. 29-30, 1980, in Rimini. □

Petro origin vs. natural origin symposium in France

A symposium on the future of petroleum-derived fatty chemicals and of those from animal and vegetable sources will be held Nov. 27-28, 1980, at the University of Bordeaux-Talence.

Speakers involved in both fields, from academia and industry, will participate. One subject to be explored will be the future costs of materials derived from the two sources.

The meeting is being sponsored by ITERG and the Petroleum Institute of France. Further information is available from ITERG, 10/A rue de la Paix, 75002 Paris, France (tele: 296-50-29). □

Food topic for Argentine meetings

This report from Argentina was provided by Meny Bergel, Laboratorio de Investigaciones Leprológicas, Rosario, Argentina.

A National Symposium on Food Industries will be held the last week of November 1980 in Buenos Aires, Argentina. Further details are available from the Secretary of State for Industrial Development, Julio A. Roca, 651-2^o, 1067 Buenos Aires, Argentina.

A colloquium, organized by the National Office of Chemistry, State Ministry for Domestic Affairs, was held September 25-26, 1980, in Buenos Aires. The major emphasis of the colloquium was on methods of chemical analysis for determining the presence of preservatives in food.

Another meeting, a seminar on food economics, was held Oct. 15 in Buenos Aires. The seminar was organized by the State Secretary for Public Health, Panamerican Health Organization.

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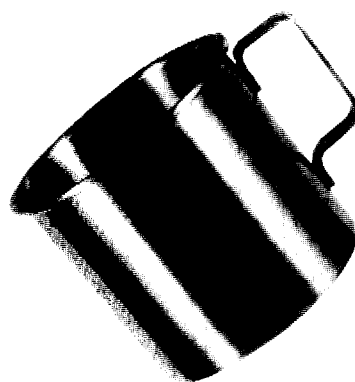
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