

A Bibliography on the Solvent Extraction of Soybeans and Soybean Products 1944-1968

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Abstract

This bibliography covers the effect of several solvents on oil removal, toxicity, color, texture or flavor of soybean flakes, flour and protein. The literature search included processes, principles and apparatus.

Introduction

Demand for soybean flour and soy proteins for food use is becoming more and more widespread. But before volume uses of these products in foods can be fully achieved, their flavor needs improving. One possibility for flavor improvement is to remove the flavor components from the soybean product by solvent extraction. A literature search on all the aspects of this process served as a basis for this bibliography.

In 1944, A. C. Beekel (27) compiled a bibliography covering solvent extraction of vegetable oils from raw materials. While searching the literature for the past 25 years, a few references were located that were published before 1944 but that were not available to Beekel. These references, therefore, have been included here at the end in a separate section.

In compiling this latest bibliography the initial literature searched was *Chemical Abstracts*. Subjects covered were soybean cake, soybean flour, soybean meal, soybean oil and soybeans. The contents of "Soybean Processing and Utilization—A Selected List of References 1955-1965" from the National Agricultural Library of USDA were also surveyed; any applicable reference not found in *Chemical Abstracts* was included. If an abstract of a cited publication did not appear in *Chemical Abstracts* during the year in which it was issued or during the succeeding year, or if the original source was not available, then the *Chemical Abstracts* reference is also given.

Arrangement of Contents

The references are arranged alphabetically by name of author or patent assignee. Multiple citations under a specific name are arranged chronologically.

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[Received May 6, 1969]

ABSTRACTS: FATS AND OILS

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6-TRANS-NONENAL: AN OFF-FLAVOR COMPONENT OF FOAM-SPRAY-DRIED MILKS. O. W. Parks, N. P. Wong, C. A. Allen and D. P. Schwartz (Dairy Prod. Lab., Eastern Utilization Res. and Dev. Div., USDA, Washington, D.C. 20250). *J. Dairy Sci.* 52, 953-6 (1969). 6-trans Nonenal has been identified as the compound responsible for the off-flavor which frequently appears in fresh, foam-spray-dried milk manufactured during the warm summer months in urban areas. The flavor threshold of this compound was found to be less than 0.07 part per billion in fresh, whole milk. Evidence suggests that 6-trans-nonenal originates by trace ozonolysis of minor lipid components on the surface of the dried product.

CHEMISTRY AND BIOLOGY OF PHOSPHOLIPIDS FROM AN UNCLASSIFIED MYCOBACTERIA, P6. M. Motomiya, A. Mayama, F. Fujimoto, H. Sato and S. Oka (The Res. Inst. for Tuberculosis, Leprosy and Cancer, Tohoku Univ., Sendai, Japan). *Chem. Phys. Lipids* 3, 159-67 (1969). Crude phospholipid fraction from P6 (Scotochromogen) prepared by extraction with chloroform:methanol (2:1), followed by removal of non-lipid contaminants by Folch's procedure and extraction with acetone, yielded three fractions by column chromatography with silicic acid. These fractions were designated as fractions I, II and III in the decreasing order of their R_f 's on thin-layer plates of silicic acid. Fraction I was identified as diphosphatidyl glycerol (cardiolipin) and was antigenic in flocculation test for syphilis, and in latex agglutination test for lepromatous leprosy. Fraction II was identified as phosphatidyl ethanolamine and Fraction III as phosphatidyl inositol monomannoside.

EFFECTS OF STRUCTURAL CHANGES OF THE PRETREATING AGENT ON ADSORPTION BY MODIFIED SILICA ADSORBENTS. R. E. Majors and L. B. Rogers (Dept. of Chem., Purdue Univ., Lafayette, Ind. 47907). *Anal. Chem.* 41, 1058-65 (1969). Because more selective adsorbents permit faster separations to be made, factors were studied which enhance the selectivity of silica gels prepared by the pretreatment of silicic acid hydrogels with various azo dyes, related to methyl orange, and with amines. The effects of systematically varying the structure of the pretreating agent on changes in selectivity and capacity

for azo dye adsorbates were investigated. As the structure of the pretreating agent increasingly deviated from that of the adsorbate, the selectivity of the gel for the adsorbate decreased and approached that of an untreated (control) gel. An increase in hydrophilic character of ring substituted groups of the dye present during gelation appeared to increase selectivity. For relatively simple structurally-related pretreating agents, such as substituted anilines and p-aminobenzenes, there was a linear relationship between the selectivity and the basicity of the amino nitrogen. However, there was no obvious relationship between the structure of the pretreating agent and the adsorbent capacity.

THE PALLADIUM TRANSMODULATOR: A NEW COMPONENT FOR THE GAS CHROMATOGRAPH. J. E. Lovelock, K. W. Charlton, and P. G. Simmonds (Jet Propulsion Lab., Calif. Inst. of Tech. 4800 Oak Grove Drive, Pasadena, Calif. 91103). *Anal. Chem.* 41, 1048-52 (1969). This paper introduces a new component for the gas chromatograph, the "gas transmodulator"; this component functions by transferring the separated components from the column carrier gas to a second carrier gas which is chosen to provide optimum performance from the detector. The construction and use of a practical gas transmodulator is described. It consists of a palladium silver alloy tube, and with it a gain in sensitivity of at least 40-fold is demonstrated in analyses using thermal conductivity and ionization cross section detectors. In addition, the device enables these detectors to be used under conditions where the column carrier gas flow is changing—such as in analysis with flow programming—which are otherwise difficult to conduct without loss of accuracy or performance.

NUCLEAR MAGNETIC RESONANCE STUDIES OF SERUM LOW DENSITY LIPOPROTEINS (LDL₂). R. B. Leslie and D. Chapman (Molecular Biophys. Unit, Unilever Res. Lab., The Frythe, Welwyn, Hertfordshire, Great Britain). *Chem. Phys. Lipids* 3, 152-8 (1969). The NMR results indicate that in LDL₂ the polar head group of the phospholipid is quite free and probably in an aqueous environment, but that the non-polar aromatic amino acid residues of the protein are somehow immobilized probably by apolar interactions with lipids. On the other

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