ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: J. G. Endres, J. Iavicoli, K. Kitsuta, F. A. Kummerow, Gladys Macy, E. G. Perkins, T. H. Smouse, J. A. Thompson and R. W. Walker

• Fats and Oils

VAPOUR PRESSURE/TEMPERATURE CORRELATIONS FOR SATURATED FATTY ACIDS. K. A. Naik, P. J. Reddy and A. Husain. *Indian J. Tech.* 5, 303–5 (1967). Temperature/vapour pressure data for satd. fatty acids C_6–C_{18} in the range 1–760 mm. Hg have been correlated into an Antoine type equation with the help of a digital computer. The following generalised correlation, which is simpler than that reported by Stage, has been derived:

$$t = \frac{M - 47.7821\sqrt{M} + (3.8850\sqrt{M} - 76.6282)\log_{10}P + 308.4952}{0.04505\sqrt{M} + 0.17503\log_{10}P - 1.91246}$$

where t is the temperature (C), M is the mol. wt. of the fatty acid and P is the pressure (mm. Hg). (Rev. Current Lit. Paint Allied Ind. No. 311.)

POLYMORPHISM IN MILK FAT SHOWN BY X-RAY DIFFRACTION AND INFRARED SPECTROSCOPY. I. L. Woodrow and J. M. deMan (Dept. of Food Science, Univ. of Alberta, Edmonton, Canada). *J. Dairy Sci.* 51, 996–1000 (1968). The occurrence of three polymorphic modifications, alpha, beta-prime, and beta was studied by X-ray diffraction and infrared spectroscopic methods. Excellent agreement between the two methods was obtained. Slow cooling of milk fat resulted in formation of the beta-prime and beta modifications. Rapid cooling of milk fat resulted in formation of the alpha form which, upon holding of the sample at 5C, underwent transformation to the beta-prime and beta forms. The high melting fraction (HMF) of milk fat obtained by crystallization from acetone existed in the beta form. Slow cooling of the melted HMF produced the beta-prime form, rapid cooling the alpha form. X-ray diffraction patterns obtained with milk fat solidified at room temperature were diffuse. Resolution was greatly improved by removal of the liquid portion of the fat by pressure filtration.

GAS CHROMATOGRAPH-COMBUSTION-CONTINUOUS COUNTING SYSTEM FOR ANALYSIS OF MICROGRAM AMOUNTS OF RADIOACTIVE METABOLITES. R. O. Martin (Dept. Biochem., Univ. of Saskatchewan, Sakatoon Sak., Canada). *Anal. Chem.* 40, 1197–1200 (1968). The total effluent of a gas chromatograph is passed over copper oxide at 800C followed by measurement of the carbon dioxide formed with a microthermistor detector. The radioactivity of the carbon dioxide after mixing with propane is measured by a simple proportional counter. There are no split flow corrections, and errors in specific activities caused by combustion variability are minimized. This approach is useful over a large range of organic compounds up to molecular weights near 400. The mass detector is sensitive to less than 0.1 μg and shows a linear response over a 2000-fold concentration range. 200 to 100,000 dpm of ^{14}C can be detected in a given peak. Both mass detector and proportional counter operate without contamination at ambient temperature.

MASS SPECTROMETER-COMPUTER SYSTEM PARTICULARLY SUITED FOR GAS CHROMATOGRAPHY OF COMPLEX MIXTURES. R. A. Hites and K. Biemann (Dept. of Chem., Mass. Inst. Tech., Cambridge, Mass. 02139). *Anal. Chem.* 40, 1217–21 (1968). A digital recording technique for low resolution, fast scanning mass spectrometers employing a medium size on-line computer is discussed. The speed with which data are taken and the large spectra storage capacity of the system make it particularly suited for recording mass spectra of gas chromatographic effluents. Some of the features of this system are that spectra are recorded continuously regardless of the emergence of gas chromatographic fractions; peak center and intensity calculations proceed while the spectrum is being scanned; secondary storage on magnetic disks allows space for a practically unlimited number of spectra; the computer controls the scanning function of the mass spectrometer; the spectra are correlated with the chromatogram by a plot of total intensity (calculated by the computer) vs. spectrum index number; and all spectra are presented in digital form (mass-intensity tables and/or plots) suitable for further processing such as correcting for background or searching standard files of spectra.

PROBLEMS ASSOCIATED WITH THE DEVELOPMENT OF FISHERIES IN TROPICAL COUNTRIES. V. INDUSTRIAL PRODUCTS AND BY-PRODUCTS. R. C. Cole (Tropical Prod. Inst.). *Trop. Sci.* 10, 6–21 (1968). In this paper the author discusses the ways in which fish is treated when it is destined for use other than human food. In recent years several of the developing countries have established themselves as leading nations in the industrial fisheries of the world. The catch being processed to fish meal and oil. The manufacture, packaging, storage and transport of these products is discussed. The term "by-products" is used here to define items manufactured incidentally from fish caught primarily for use as food. These products include glues, leathers, fertilizers, fish-liver oils and refined pharmaceutical products.

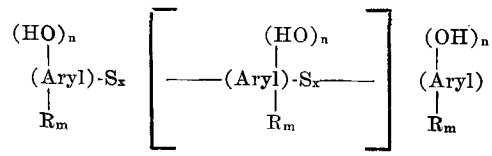
OIL ADDITIVES. III. ANTIOXIDATION BY MIXTURE OF ZINC DIALKYL DITHIOPHOSPHATES. Sumio Akamatsu and Kenji Negoro. *Yukagaku* 17, 359–62 (1968). In order to increase the solubility of zinc dialkyl dithiophosphates having lower alkyl radical (isopropyl, butyl etc.) in liquid paraffin, binary or ternary mixture containing longer chain dialkyl dithiophosphates was prepared. When the content of longer chain compound (e.g. 4-methyl-2-pentyl, cyclohexyl, 2-ethylhexyl) in the mixture containing 2 or 3 kinds of dialkyl dithiophosphates exceeds 60%, the mixture of dialkyl dithiophosphates becomes soluble in liquid paraffin. Their antioxidant actions in the paraffin auto-oxidation are similar to those obtained in the use of single component of the mixed system. The combination of dialkyl dithiophosphates and phenothiazine or phenyl-α-naphthylamine exhibits high synergism. In order to improve slight solubility of phenothiazine in liquid paraffin, dilauryl phthalate or methyl naphthalene is added. This also results in an improvement of antioxidant action.

CHEMISTRY OF PEROXIDES. Hiroshi Minato (Tokyo Metropolitan Univ.). *Yukagaku* 17, 333–40 (1968). A review with 48 references.

FERULATES CONTAINED IN RICE BRAN OIL. I. ANALYSIS OF THE FERULATES BY MEANS OF GLC AND TLC. Tomio Endo, Kiichiro Ueno and Yanosuke Inaba (Nakataki Pharm. Ind. Co., Tokyo). *Yukagaku* 17, 344–8 (1968). Unsaponifiable fraction of rice bran oil yielded 7 ferulate esters. The alcohols were campesterol, stigmasterol, β-sitosterol, cycloartanol, cycloartenol, 2,4-methylenecycloartenol and a new unidentified substance. Physico-chemical properties of these alcohols and their ferulates are given.

DETERIORATION OF FRYING OILS IN CONTINUOUS WATER-SPRAYING AND HEATING SYSTEM. X. INFLUENCE OF WATER-SPRAYING AND STEAM BLOWING ON FAT HYDROLYSIS. Etsuji Yuki (Food Ind. Expl. Sta., Hiroshima Pref.). *Yukagaku* 17, 341–4 (1968). The water content of frying oil treated by the water-spraying method was twice as high as that of oil treated by the steam-blowing method. The rate of hydrolysis of the frying oil was much higher by the water spraying method.

METHOD OF BLEACHING AND STABILIZATION OF TALL OIL DURING DISTILLATION THEREOF. L. F. Ciesielski and C. G. Wheelus (Arizona Chemical Co.). *U.S. 3,377,333.* In the distillation of tall oil and tall oil fractions, with or without fractionation, improved color and stability are obtained by carrying out the distillation in the presence of catalytic amounts of a phenol sulfide of the formula



PROCESS FOR ISOMERIZING UNSATURATED FATTY ACIDS OR DERIVATIVES THEREOF. V. L. Larimer (Ashland Oil and Refining Co.). *U.S. 3,377,367.* Oleic acid is isomerized from the *cis*