

SYMPOSIUM ON NON-VAPOR PHASE TECHNIQUES FOR ISOLATION AND IDENTIFICATION OF FLAVOR COMPOUNDS

Introduction

Two papers presented by Drs. Freeman and Oertel of International Flavors & Fragrances and Procter and Gamble, respectively, very adequately pointed to the value of Raman spectrometry in flavor chemical identification. Especially yielding are those multifunctional heterocyclic, alicyclic, and aliphatic compounds which will form the basis of the flavors of the future (pyrroles, pyrazines, thiazoles, cyclic and aliphatic mono-, di- and trisulfides, etc.). The work presented was so convincing that the manufacturers of Raman spectrometers may experience a sudden rise of interest from flavor chemists. The written papers in this volume contain considerable detail of the proper techniques to be used for obtaining good Raman spectra.

Dr. S. T. King (Dow Chemical Company) did an excellent job of putting infrared Fourier transform spectrometry in perspective for those who do not follow such analytical developments closely. I believe the take-home message was that before the tremendous sensitivity and information handling capability of infrared Fourier transform spectrometry can be fully realized, work must be done to effectively condense samples into a very small area. This capability will become more apparent to flavor chemists as these problems are worked out.

Dan Schwartz (Agricultural Research Service, United States Department of Agriculture, Washington, D. C.) did a superlative job of reviewing his life's work during his oral presentation. Since this work has been published in various journals, the paper does not appear in this symposium. One cannot help be a bit overwhelmed at the contributions one man has made at reducing known chemistry to microchemical techniques. If you need a micro-method for studying any chemical of flavor interest, be sure to check into the methods developed by Dan. Look for them in *Analytical Chemistry*, *Microchemical Journal*, and the *Journal of Agricultural and Food Chemistry*.

The papers by R. J. Molyneux (Agricultural Research Service, United States Department of Agriculture, Western Regional Research Laboratories) and S. R. Palamand (Anheuser-Busch) on the use of high-pressure liquid chromatography (hplc) leave no doubt that hplc is a tool with high resolving capability and flexibility. We saw how the technique was used to monitor chemical conversions of humulones to isohumulones, and chromatograms were resolved in under 30 min. All synthetic chemists should take note. Also, Glenn Martin (Bureau of Alcohol, Tobacco, and Firearms, Internal Revenue Service, Washington, D. C.) reported that hplc is a method of choice in separating ethyl vanillin from vanillin, which should be important news to quality control chemists of vanilla, oleoresins, and regulatory agencies. Flavor chemicals which tend to deteriorate and polymerize during storage (phenols, enals) can be properly studied and quality controlled by using hplc to separate and determine polymers. What's more, this can be done relatively quickly, efficiently, and conveniently. All analytical chemists interested in natural products will be interested in J. Schmit's (duPont) paper because it shows how complex mixtures of chemicals in the form of natural oils can be prefractionated by hplc to provide fractions which lend themselves to simple gc resolution. This was essentially all new information. Ahmed Mabrouk reviewed the various column techniques and methods of analysis of flavor precursors and other components from meat. He dwelled on the strengths and weaknesses of the methods used and pointed to some newer techniques that should be used in lieu of old techniques. For example, did you know that one can deionize fractions eluting from liquid chromatography columns directly by employing a commercially available ultrafiltration cell? Ahmed's paper is not part of the published symposium, but all flavor chemists working with precursors will find this work published in past issues of the *Journal of Agricultural and Food Chemistry*.

Because our schedule was running overtime, the last speaker did not have time to properly present all his data (Clyde Young, University of Georgia) on an analytical technique based on arginine content, which will be used to predict the time of harvesting of peanuts. The profound commercial implications of this development may not be so obvious to those not familiar with peanut production and processing. Complete data are either presented in this symposium or appropriate references are included.

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