

**930739**

### Highlights

This applications brief describes reverse phase HPLC and UV detection for separating vitamin A esters in feeds and foods. (See Applications Brief 1008 for the normal phase HPLC and fluorescence detection approach to vitamin A ester analysis.)

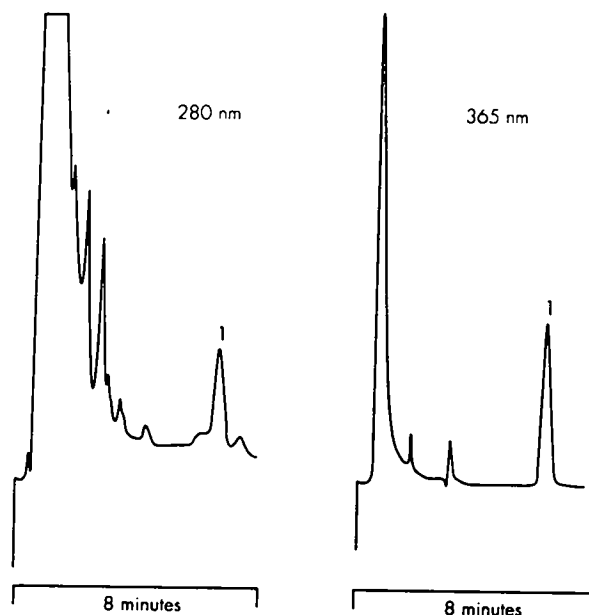
### Operating Conditions

**Sample preparation:** Extraction by sonication in mobile phase and filtration  
**Column:** Waters™ Resolve™ C<sub>18</sub>, 8' X 100 mm  
**Mobile phase:** Acetonitrile/tetrahydrofuran/water, 55/37/8  
**Flow rate:** 4.0 ml/min.  
**Detection:** Waters 440 Absorbance

The extraction of the esters into non-aqueous solvents keeps them intact as retinyl acetate or palmitate which are more stable than retinol as forms of vitamin A. This method is best suited for fortified samples. A limitation is that triglycerides and other non-polar co-extractives must be periodically removed from the column by stronger solvents. The higher wavelength (365 nm) yields better sensitivity and specificity.

### Vitamin A Palmitate in Breakfast Cereal

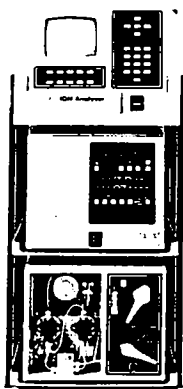
1. Vitamin A Palmitate



### Reference

1. Morawski, J. *Fat Soluble Vitamin Method Book for the Determination of Vitamins A, D, and E in Foods*. Millipore Corporation (1984).
2. Ball, G. F. M. *Fat Soluble Vitamin Assays in Food Analysis*. Elsevier Applied Science, Chapter 8 (1988).

## **Ion Chromatography**



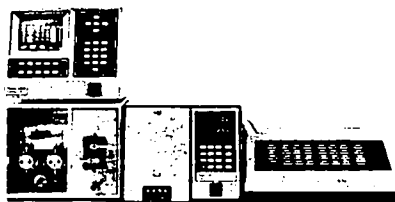
Stainless steel and non-metallic systems. Innovative detectors. Linear quantitation over a wide concentration range with single point calibration. If you need to analyze for mono- and divalent cations, ionic surfactants, organic acids, anions, metals, and metal complexes, talk to Waters.

## **Data management**



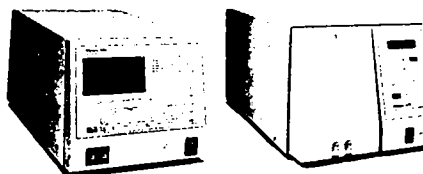
Single and multi-system data acquisition and control. Networking computers. Baseline™, Maxima™, and Expert™ Ease Chromatography Software. NEC and DEC hardware. From integrators to networking computers, Waters has a data solution to meet your every need.

## **PowerLine™ Systems**



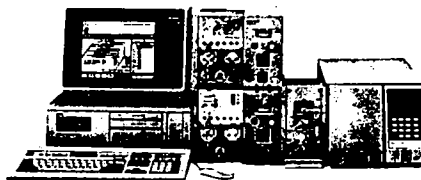
Single keyboard control and programming of pumps, injectors, and detectors with or without a separate personal computer. Waters PowerLine HPLC Systems put HPLC power where it belongs—at your fingertips. All Waters PowerLine HPLC, IC, GPC, GC and Preparative Chromatography Systems are controlled from the keyboard of the 600E PowerLine Module.

## **Detection**



UV/Vis: photodiode array, fixed, variable and programmable wavelength. Refractive index. Conductivity. Electrochemical. Fluorescence: fixed and programmable/scanning wavelength. Waters offers the food technologist the best choice of detectors to solve separations problems now and in the future.

## **Special-purpose systems**



Waters offers special-purpose systems for polymer analysis, amino acid analysis, peptide analysis, carbamate analysis, preparative chromatography, LC-MS, and sugar analysis. These systems come with installation and training, optimized methods, quality-tested chemistries, and the right combination of pumps, injectors, and detectors for reproducible analyses.

## **Chemical Products**



Analytical to pilot plant scale chemistries. Bulk media. Specialty columns for amino acids, peptides, proteins, fatty acids, carbohydrates, organic acids, carbamate pesticide residues and polymers. Guard columns. Solid phase extraction cartridges. Radial compression technology. Sample filtration. Robotics. From sample preparation to post-column derivatization, Waters chemical products are essential for doing high-resolution chromatography.

## **Support and Service**

Waters technical and service representatives are the best in the business. Along with Waters applications chemists, they create a support network which guarantees your satisfaction.

**Waters**  
Division of MILLIPORE

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