chrozen

Vitamin Analyzer



One Platform | Multiple Methods | Complete Vitamin Characterization

YOUNG IN Chromass

Why Vitamin Analysis Matters ?

The Expanding Market for Accurate Vitamin Testing

With consumers prioritizing wellness more than ever, the health industry is experiencing rapid and sustained growth. As a result, verifying vitamin content has become an essential part of product quality and regulatory compliance across the nutritional supplement, food, and pharmaceutical industries. Moreover, both fat-soluble vitamins (A, D, E, K) and water-soluble vitamins (B-complex, C) require precise analytical methods due to their low concentrations and chemical instability.



Optimized Workflows for Vitamin Characterization

Because many vitamins are highly unstable compounds that are easily oxidized or degraded during sample preparation, analytical workflows must be optimized to minimize loss and ensure data reliability. To address these challenges, ChroZen Vitamin Analyzer is engineered specifically for accurate and reproducible vitamin analysis, supporting trace-level (ppb) quantification while reducing degradation and improving analytical confidence.

Efficient Sample Handling

Simple and streamlined sample preparation minimizes workflow time and enhances overall productivity.

Reliable Trace-Level Detection

Designed to quantify vitamins at trace concentrations with exceptional accuracy and reproducibility.

Intuitive Method Setup

Method parameters can be easily configured through the CDS (Chromatography Data System) for consistent and repeatable results.

Application-Ready Support

Paired with recommended columns and consumables, the system supports method optimization and tailored applications.

Optimized Cost Efficiency

High analytical efficiency lowers operational expenses, offering superior cost-effectiveness over time.

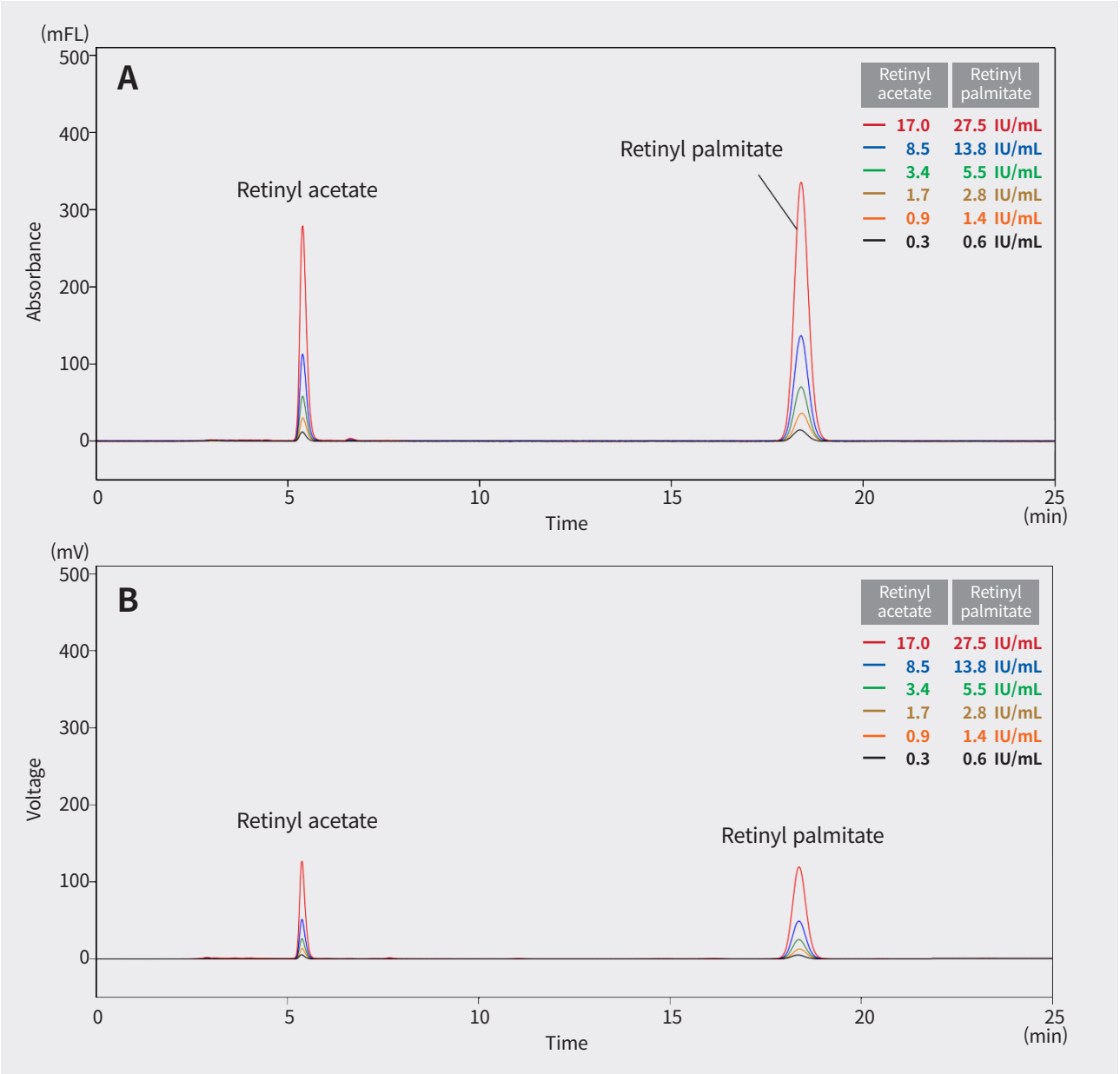
Long-Term Reliability

Built for stability and durability, the system ensures low maintenance requirements and consistent long-term performance.



Quantitative Analysis of Vitamin A Derivatives in Nutritional Supplements & Cosmetics

The analysis of vitamin A requires multiple sample preparation procedures such as saponification, liquid-liquid extraction, and decompression drying treatment. This application applies simple sample preparation to determine the derivative form of vitamin A not the hydrolyzed form, retinol to confirm the system suitability for ChroZen Vitamin Analyzer.



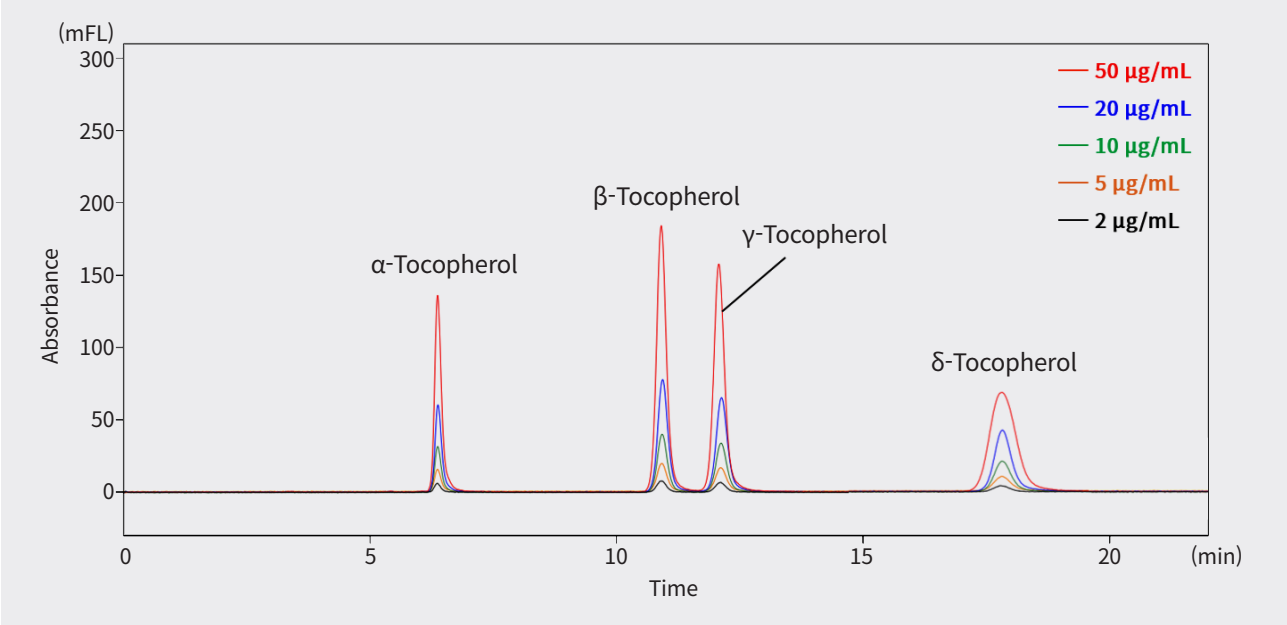
Overlaid Chromatograms of Vitamin A derivatives Standards

(A) Fluorescence detector, (B) UV/Vis detector

IU: International Unit, usually used to measure fat soluble vitamins including Vitamin A, D and E.
The conversion of IU to mg varies depending on the nutrient.

Determination of Vitamin E in Nutritional Supplements

Vitamin E is a fat-soluble vitamin and the primary function of Vitamin E is to act as an antioxidant to protect unsaturated fatty acids in cell membrane phospholipids from oxidation, thereby assisting the anti-aging.
Because of the difficulty of separation in β–and γ–tocopherol with the reverse-phase method, the normal-phase method was applied, and a fluorescence detector with higher sensitivity and selectivity than a UVD was used for the accurate analysis result.
In this application note, the analysis of Vitamin E in iron supplements was carried out using ChroZen Vitamin Analyzer with normal-phase method to analyze all isomers like β-and γ-isomers.



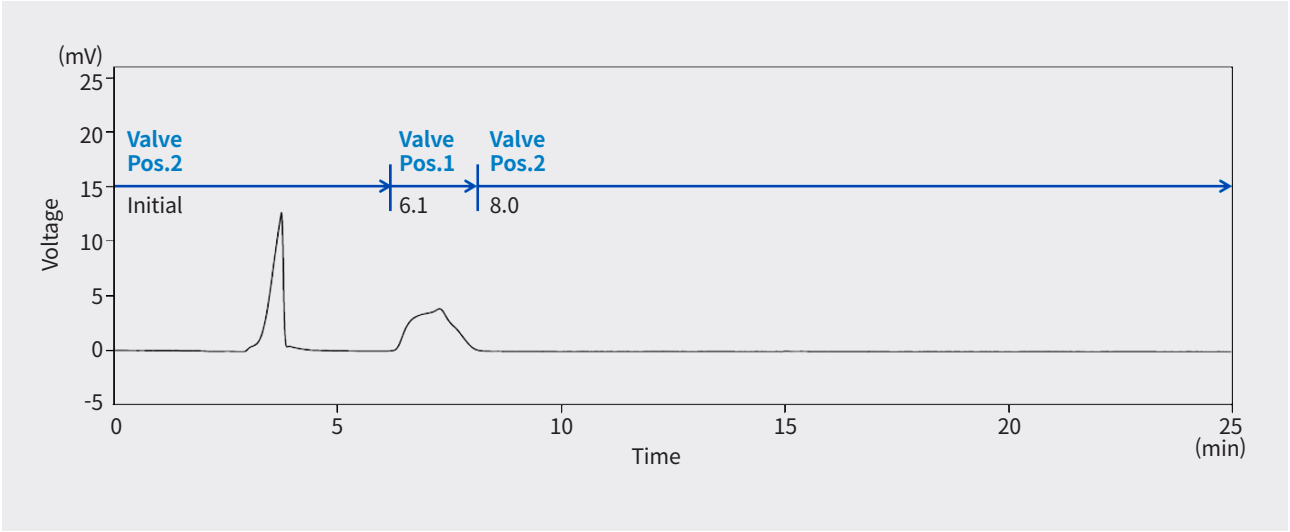
Overlaid Chromatograms of Tocopherols Standards by Concentration

	Analyte	R.T. (min)	STDEV	LOD (µg/mL)
1	α-Tocopherol	6.34	1.410	0.167
2	β-Tocopherol	10.87	0.967	0.059
3	γ-Tocopherol	12.02	1.851	0.119
4	δ-Tocopherol	17.81	2.935	0.273

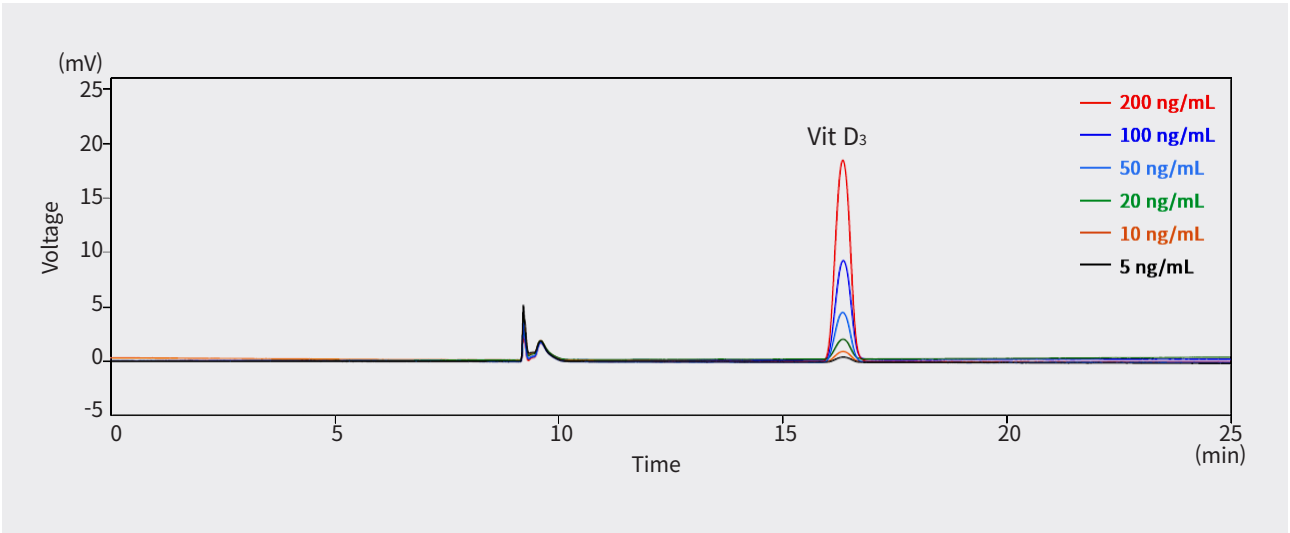
Validity of test method by ChroZen Vitamin Analyzer (Concentration of 2 µg/mL, n=10)

Column-Switching Strategy for Sensitive Detection of Vitamin D3

The determination of Vitamin D3 (Cholecalciferol) at trace levels was performed using the ChroZen Vitamin Analyzer equipped with a switching valve system. The method incorporates a focusing column to concentrate the target compounds and employs a two-stage separation process to enhance resolution.



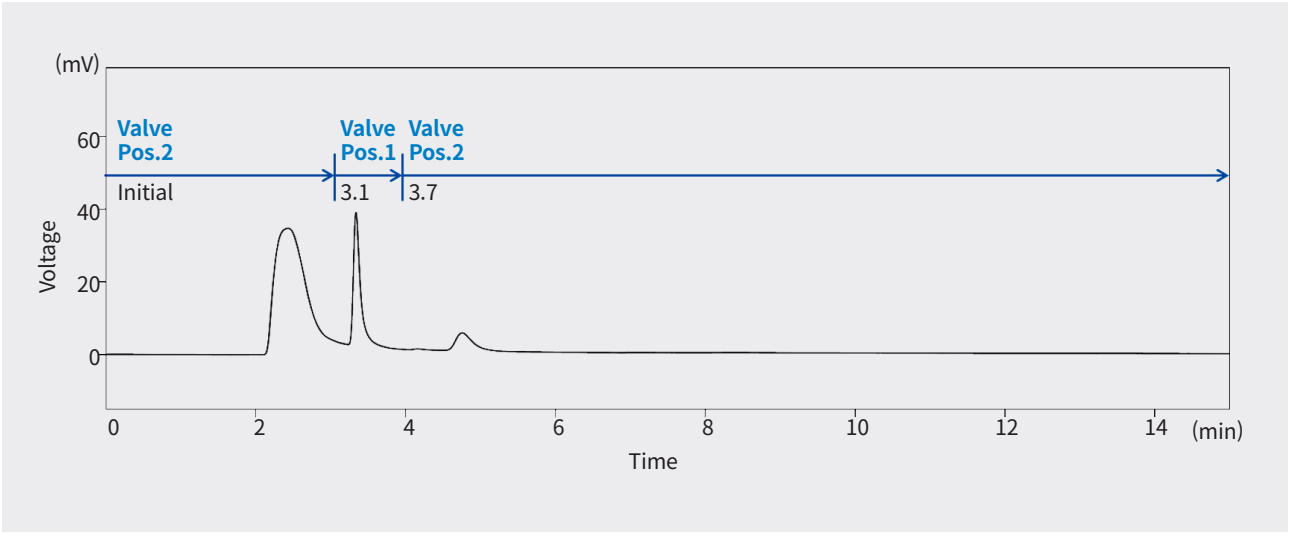
Determination of Valve Switching Time



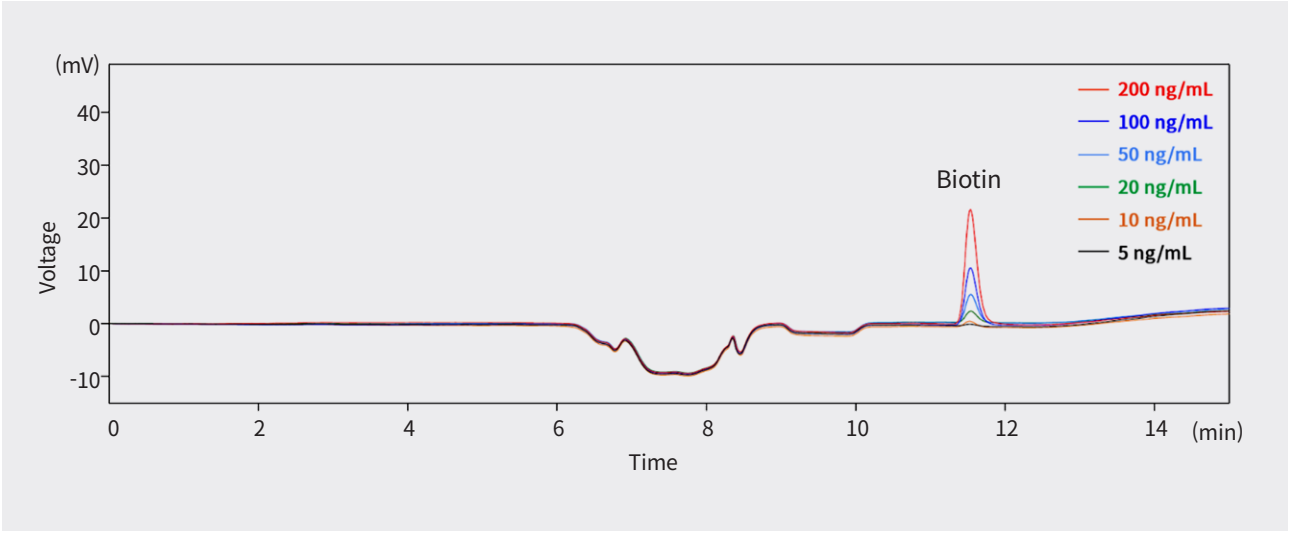
Overlaid Chromatograms of Cholecalciferol Standards by ChroZen Vitamin Analyzer with Multiple Columns and a Switching Valve System

Optimized Method for Sensitive Biotin (Vitamin B7) Detection

Biotin (Vitamin B7) supports energy metabolism, healthy skin, nails, and nervous system function, which makes it an important nutrient in supplements and fortified foods. However, because biotin exists at very low concentrations and easily degrades during sample handling, accurate analysis can be challenging without a sensitive and well-controlled method. ChroZen Vitamin Analyzer with a switching valve enables trace-level biotin determination by combining saponification and liquid–liquid extraction with a focusing column and two-stage chromatographic separation, providing improved resolution, sensitivity, and reproducibility suitable for high-precision analysis of food and supplement matrices.



Determination of Valve Switching Time



Overlaid Chromatograms of Biotin Standards

Configurations

Standard Vitamin Analyzer

Item	Description	Part No.
Pump	ChroZen HPLC Quaternary Gradient Pump with Vacuum Degasser	9421011020
Autosampler	ChroZen HPLC Autosampler	5421011020
Column oven	ChroZen HPLC Column oven for Analytical scale	3421011020
Detector (Selection Depending on the Target Compounds)	ChroZen HPLC Fluorescence Detector	7441011020
	ChroZen HPLC UV/Vis Detector	7411011020
Install. Option	HPLC Performance Kit (Without LC C18 Column)	1601011890
CDS	YL-Clarity software for single instrument of YCM HPLC	5301011000
	Autosampler control of YL-Clarity	5301011040
	System Suitability Test of YL-Clarity	5301011050
Column (Recommended Depending on Customer's Application)	C18 Column	-

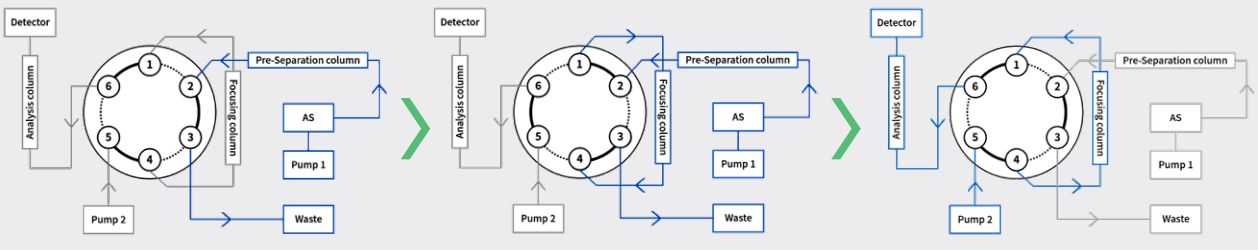
Comparison of With/Without Column Switching Valve

	Without Column Switching	With Column Switching
Sample Preparation	Complicated (heating, concentration, filtration, extraction, etc.)	Simple
Sample Injection Volume	Less that 100 uL	Max. 5 mL depending on sample loop volume
Mobile Phase Flow Rate	1 mL/min on average	0.1~0.5 mL/min

Vitamin Analyzer with a Switching Valve

Item	Description	Part No.
Pump	ChroZen HPLC Quaternary Gradient Pump with Vacuum Degasser X 2	9421011020
Autosampler	ChroZen HPLC Autosampler	5421011020
Column Compartment	ChroZen HPLC Column Oven for Analytical scale	3421011020
Detector (Selection Depending on the Target Compounds)	ChroZen HPLC UV/Vis Detector with dual wavelength	7411011020
	ChroZen HPLC Fluorescence Detector	7441011020
Install. Option	HPLC Performance Kit	1601011890
CDS	YL-Clarity software of YCM HPLC for single instrument control	5301011000
	Autosampler control of YL-Clarity	5301011040
	Add one Instrument of YL-Clarity	5301011030
Column (Recommended Depending on Customer's Application)	Pre-column Analysis Column Focusing Column	-
Switching Valve	6-port 2-position valve, SS/PEEK, 40MPa , 0.4, 10-32 for ChroZen HPLC	3421012020

Valve Diagram



Step 1 **First Separation** Step 2 **Concentration** Step 3 **Second Separation**



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