

This application note describes the analysis of fungicides in citrus fruits by high-performance liquid chromatography (HPLC) using detection with both fluorescence (FL) and UV absorption (UV).

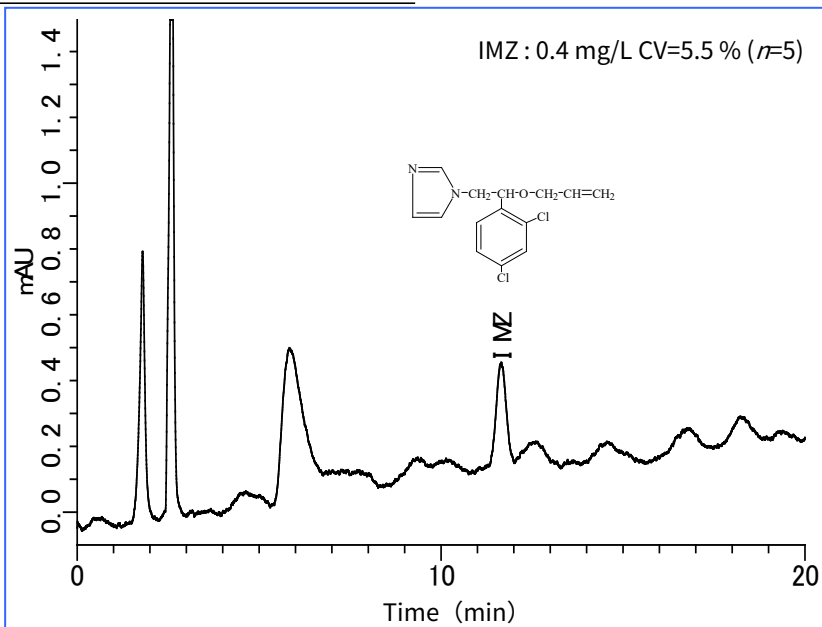
In the 1980s, fungicides were introduced as post-harvest pesticides and used for long-term storage of fruits and vegetables. Since the 1990s, imported disposable chopsticks have also become a problem. Even today, fungicides are still approved for use in the safety of imported foods, and residue limits have been established.

In order to analyze fungicides, the separate analysis of Imazalil (IMZ) and simultaneous analysis of three other components, orthophenylphenol (OPP), thiabendazole (TBZ) and diphenyl (DP), were carried out under the Hygiene No. 15 Notice Law.

- Citrus Reference Values

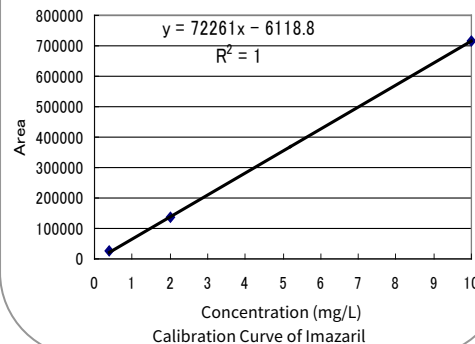
• Imazalil	:5 mg/kg	Individual analysis
• Orthophenylphenol	:10 mg/kg	
• Thiabendazole	:10 mg/kg	UV detection
• Diphenyl	:70 mg/kg	
		Simultaneous analysis

Example of measurement of an Imazalil standard solution with UV detection

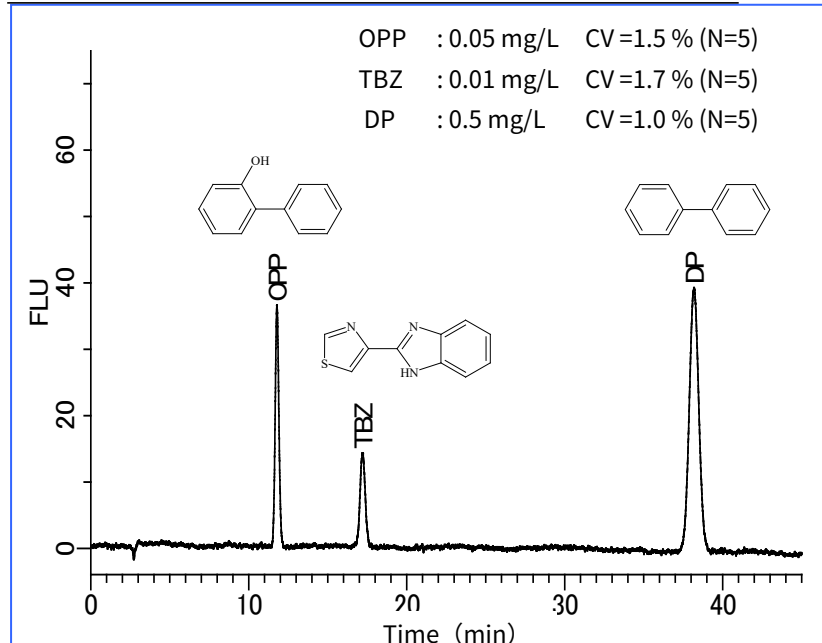


HPLC conditions

Column	: Inertsil ODS-3 (5 μm, 250 x 4.6 mm I.D.)
Eluent	: A) CH ₃ OH B) H ₂ O A/B = 85/25, v/v (gradient mixer)
Flow rate	: 1.0 mL/min
Column temperature	: 40 °C
Detected	: UV 230 nm
Injection volume	: 10 μL

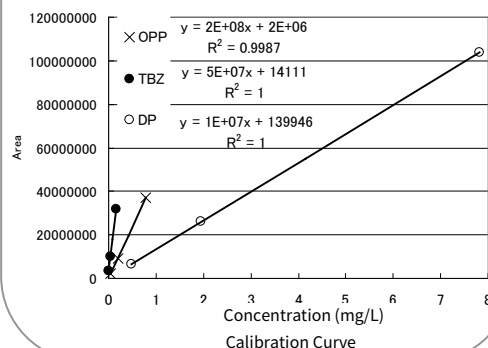


Example of measurement of orthophenylphenol, thiabendazole, and diphenyl standard solution with fluorescence detection.



HPLC conditions

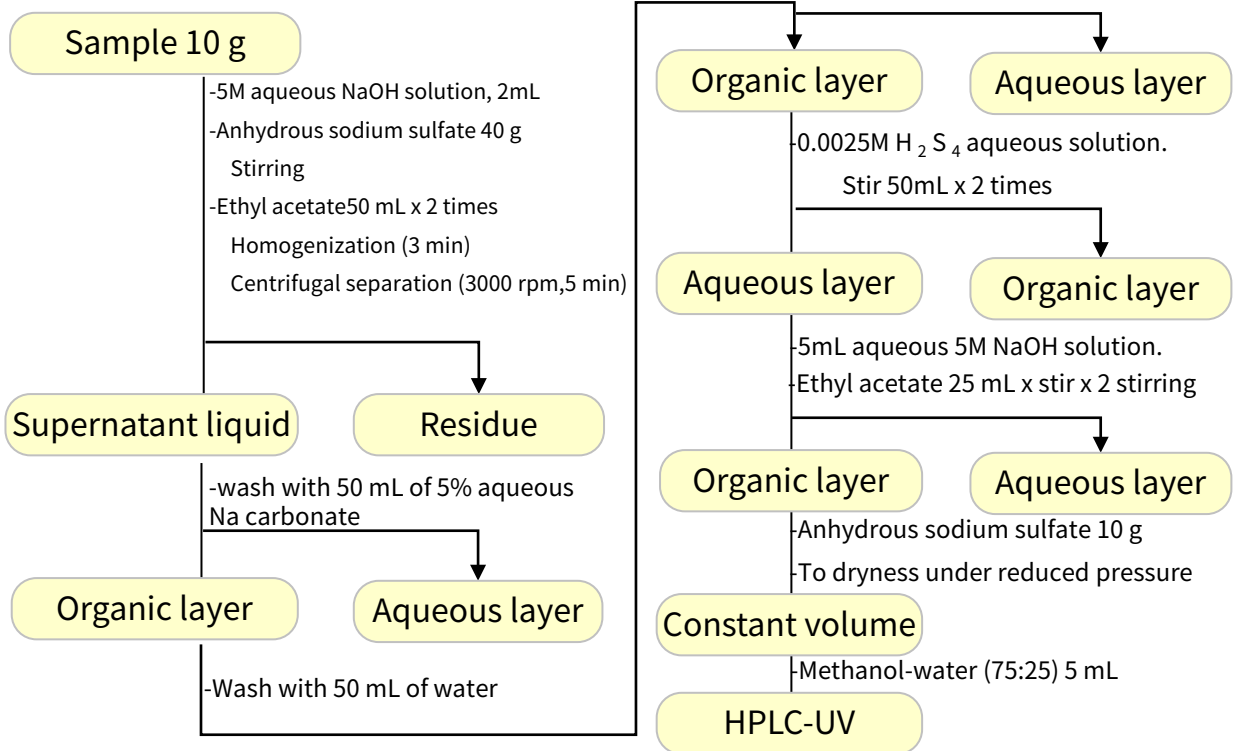
Column	: Inertsil ODS-3 (5 μm, 250 x 4.6 mm I.D.)
Eluent	: CH ₃ CN : CH ₃ OH : H ₂ O = 5 : 60 : 35, v/v 10 mM SDS added with phosphoric acid at pH 2.5
Flow rate	: 1.0 mL/min
Column temperature	: 40 °C
Detected	: FL Ex. 285 nm Em. 325nm
Injection volume	: 10 μL



※Analytical methods for IMZ, OPP, TBZ, and DP in disposable chopsticks under the Food Safety Notification No. 0331002 vary, but the same analytical conditions are used.

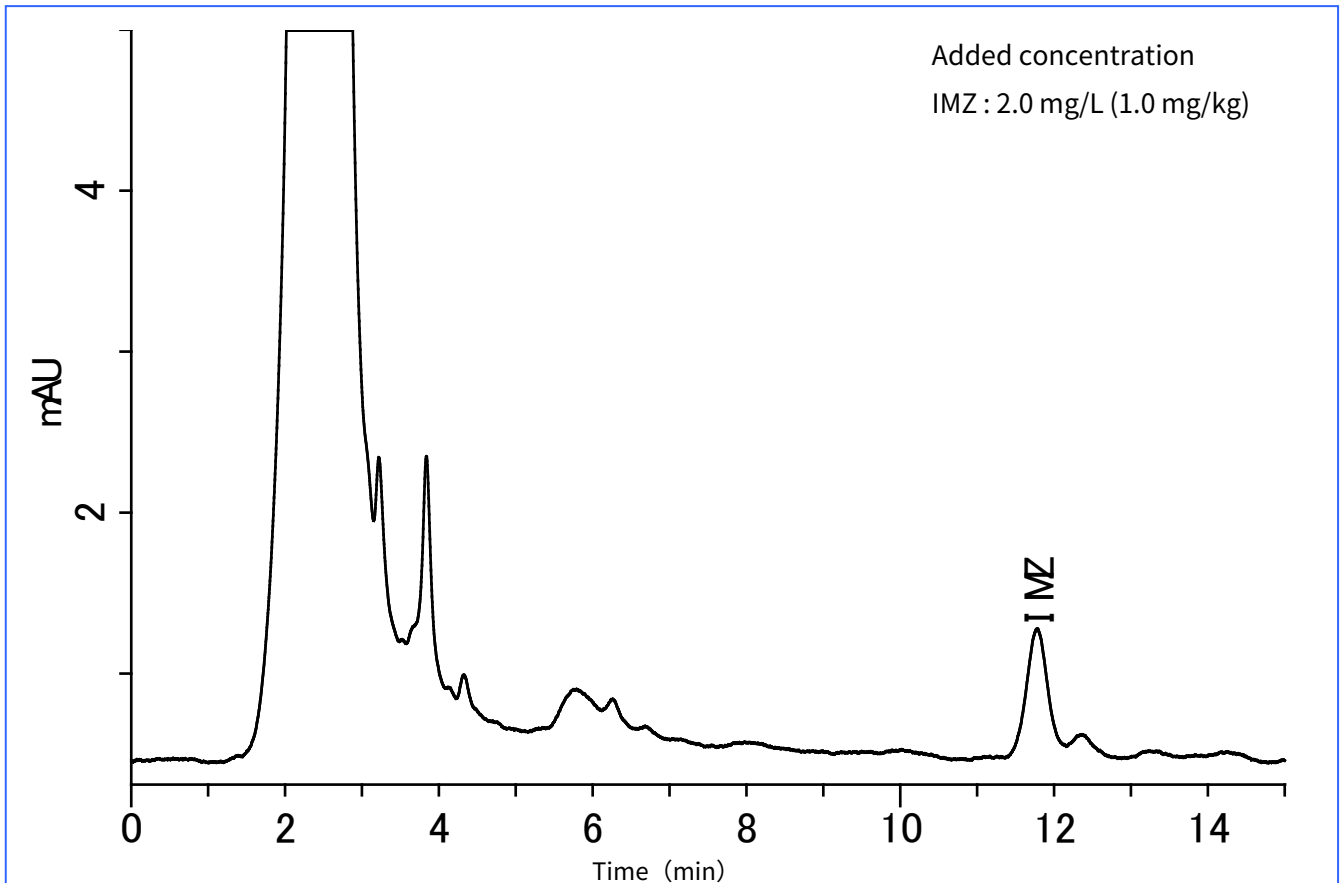
Imazalyl in lemons

Pretreatment method :



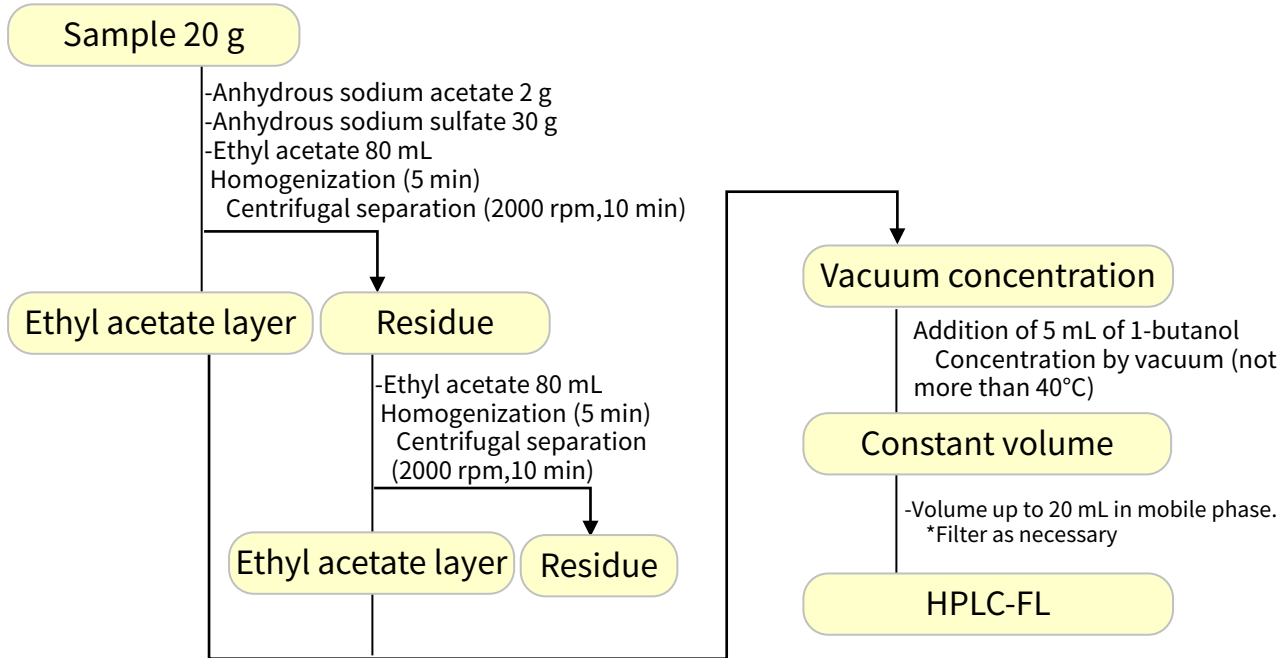
Chromatogram of standard added sample

Detection is possible at a concentration of $1/10^{th}$ or less of the reference value, resulting in a good chromatogram.



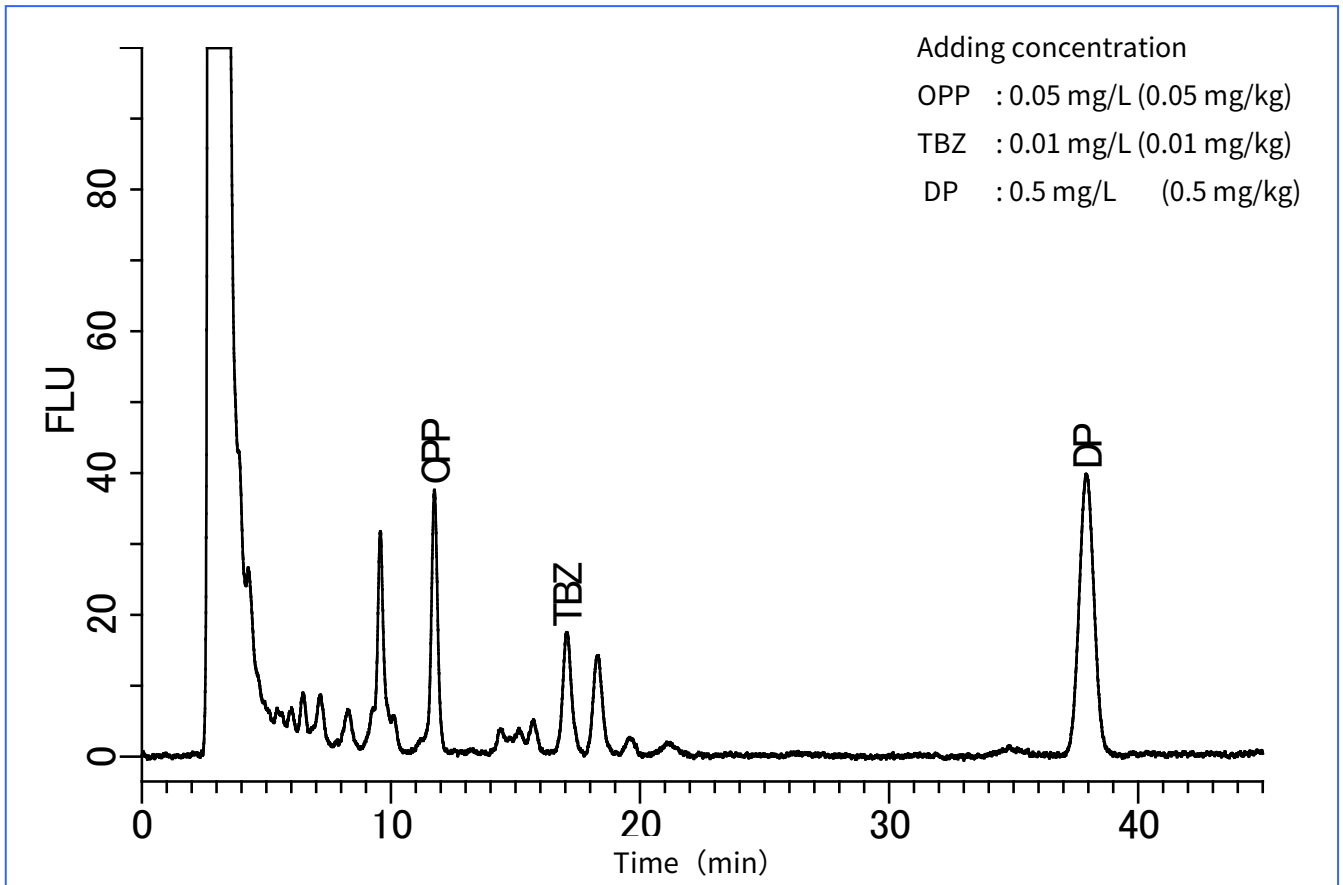
Orthophenylphenol, thiabendazole, diphenyl in lemon

Pretreatment method :



Chromatogram of standard added sample

It is also well separated from contaminants at concentrations of 1/10 th or less of the standard value, and can be quantified.



IMAZALYL - TEST METHOD FOR ANALYSIS OF PESTICIDE RESIDUES

This section describes an analytical method for imazaryl, a residual pesticide in accordance with the Food Safety Notification No. 0124001 of Japan.

HPLC conditions

Column : Inertsil ODS-3
(5 μ m, 250 x 4.6 mm I.D.)

Eluent : A) CH₃ CN
B) 10 mM KH₂PO₄
A/B = 70/30, v/v
(gradient mixer)

Flow rate : 0.7 mL/min

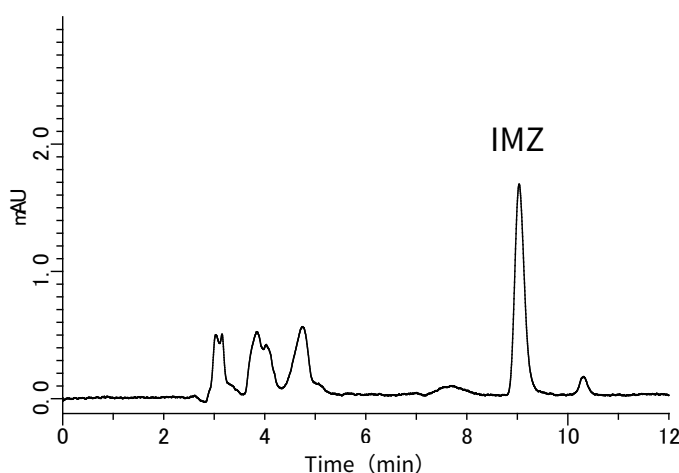
Column temperature : 40 °C

Detected : UV 230 nm

Injection volume : 10 μ L

Example: Measurement of standard

IMZ : 5.0 mg/L



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