-Simultaneous analysis of four agricultural chemical components-

Iprodione, asulam, thiophanate-methyl, and siduron are four agricultural chemicals that are designated as water quality management target items. Simultaneous analysis of these chemicals typically requires the use of LC/MS. The accuracy of this analysis must be within 20% of the coefficient of variation, and is determined by analyzing samples that are 1/100 of the concentration of target values (0.003 mg/L or 0.002 mg/L for asulam). If this sample is concentrated by a factor of 500, the resulting concentration (1.5 mg/L or 1.0 mg/L for asulam) is within the measurement capability of a high-sensitivity DAD system (See Technical Data No. 187).

The text below describes examples of analyses performed.

Analysis of four agricultural chemical components

[Component and Target value]

Name of chemical	Component	Molecular formula	Application	Target value [mg/L]
Iprodione	3-(3, 5-dichlorophenyl)-*N*-isopropyl-2, 4-dioxoimidazolidine-1-carboxamide	$C_{13}H_{13}Cl_2N_3O_3$	Germicide	0.3
Asulam	methyl sulfanilycarbamate	$C_8H_{10}N_2O_4S$	Herbicide	0.2
Thiophanate-methyl	dimethyl 4, 4' -(*o* -phenylene) bis (3-thioallophanate)	$C_{12}H_{14}N_4O_4S_2$	Germicide	0.3
Siduron	1-(2-methylcyclohexyl)-3-phenylurea	$C_{14}H_{20}N_2O$	Herbicide	0.3

Sample preparation: Standard solution: Prepared with acetonitrile so that the concentration will be 0.2 to 20 mg/L.

[Solid phase extraction procedure]

SPE Cartridge NOBIAS RP-SG1*

Conditioning
← Acetonitrile 20 mL
← Diluted nitric acid (pH3.5) 20 mL

Sample loading
← 500 mL
Mixture of pesticides
Sodium ascorbate 20 mg/L
10% EDTA 2 mL
pH3.5 (Nitric acid)

Washing
← Pure water 10 mL

Drying
← Blow the N_2 gas into the cartridge

Elution
← Acetonitrile 3 mL

Concentration
← Blow the N_2 gas into the eluate and fill up to 1 mL by eluent

Measurement (HPLC)

* NOBIAS RP-SG1

A reverse-phase polymer-based solid-phase packed column.

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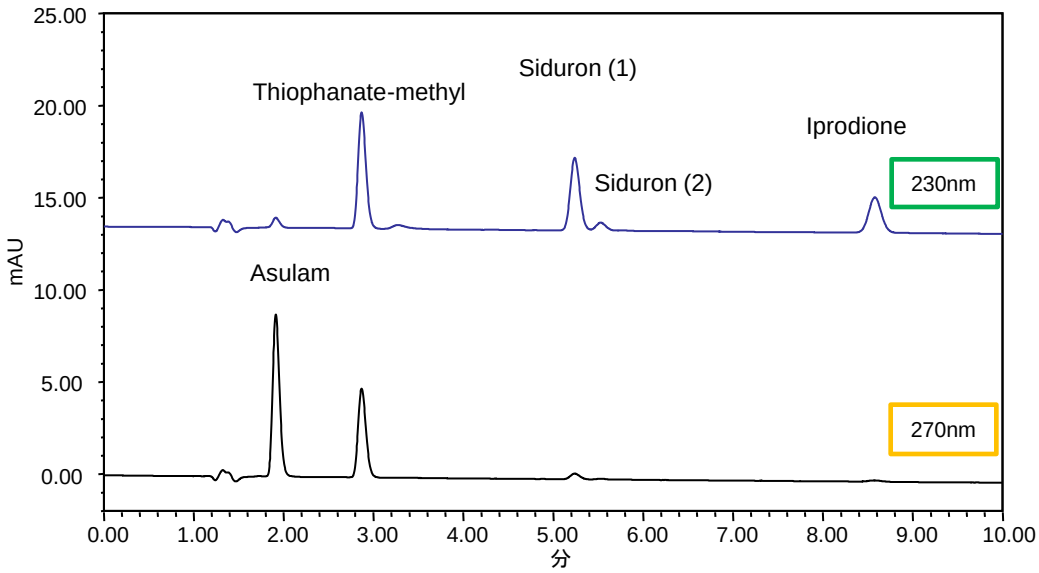
[Example of analysis of a standard sample]

Sample concentration: 1.0 mg/L per component



[System configuration]

Chromaster 5110 Pump
Chromaster 5210 Autosampler
Chromaster 5310 Column Oven
Chromaster 5430 DAD
Empower 2 Data Processing System

[LC conditions]

Column	:HITACHI LaChrom C18 (3 µm) 4.6 mmI.D.×150 mm
Eluent	: 50 mM potassium dihydrogen phosphate (pH 3.0)/ acetonitrile =45 / 55
Flow rate	: 1.0 mL/min
Temperature	: 40℃
Detection	: 270 nm Asulam 230 nm thiophanate-methyl, siduron, iprodione
Inj.vol	:10 µL

[Linearity]

At a 0.2 to 20 mg/L concentration, the sample produces a favorable straight line.

[Asulum] R^2:0.9998, [Thiophanate methyl] R^2 :0.9999
[Siduron(1)] R^2 :0.9999, [Siduron(2)], R^2 :0.9999, [Iprodione] R^2 : 0.9999