Cayman Chemical
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CERTIFIED REFERENCE MATERIAL

8 components: 1000ug/ml each of Cypermethrin [CAS:52315-07-8] ; Dimethomorph [CAS:110488-70-5] ; Fenhexamid [CAS:126833-17-8] ; Flonicamid [CAS:158062-67-0] ; Fludioxonil [CAS:131341-86-1] ; Piperonyl butoxide [CAS:51-03-6] ; Thiamethoxam [CAS:153719-23-4] ; Quintozene [CAS:82-68-8] in Acetonitrile

Lot N: 0806035 Ref N: 39364 Certification Date: 11.04.2025
Barcode: 93338936

Component	Certified Value* and uncertainty [µg/ml]	CAS	Chemical Formula
Cypermethrin	999.2 ± 10.2	52315-07-8	$C_{22}H_{19}Cl_2NO_3$
Dimethomorph	1000.7 ± 12.9	110488-70-5	$C_{21}H_{22}ClNO_4$
Fenhexamid	1001.8 ± 13.1	126833-17-8	$C_{14}H_{17}Cl_2NO_2$
Flonicamid	998.6 ± 13.1	158062-67-0	$C_9H_6F_3N_3O$
Fludioxonil	1013.5 ± 13.1	131341-86-1	$C_{12}H_6F_2N_2O_2$
Piperonyl butoxide	1011.0 ± 9.7	51-03-6	$C_{19}H_{30}O_5$
Thiamethoxam	999.5 ± 13.0	153719-23-4	$C_8H_{10}ClN_5O_3S$
Quintozene	999.5 ± 12.8	82-68-8	$C_6Cl_5NO_2$

***** *WQP 5.15.1/2 The certified value was obtained gravimetrically and confirmed experimentally by GC/MS or HPLC*

Density 0.7917 g/cm^3 at 20°C

Starting Material	Purity, Batch
Cypermethrin	97.19% (41583890)
Dimethomorph	98.3% (41562758)
Fenhexamid	99.04% (41599655)
Flonicamid	99.71% (41606261)
Fludioxonil	99.9% (41567074)
Piperonyl butoxide	91.4% (41573068)
Thiamethoxam	99.9% (41564431)
Quintozene	95.6% (41532164)

Storage Conditions: Store in a freezer at -18°C or below

Expiry Date: 11.05.2027

Concept of Certification and traceability statement:
This certified reference material is produced by gravimetric measurement and directly dissolving the individual substances in the corresponding solvent, when such is needed. In case direct dissolution is not possible, the individual substances are pre-dissolved in a suitable solvent and then gravimetrically added into the solution.
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA 4/02 and incorporates the uncertainties of the raw-material purity, the mass and the volume.
The metrological traceability is defined as the "property of a measurement result whereby the result can be related to a reference through a documented unbroken chain of calibrations, each contributing to the measurement uncertainty".
The metrological traceability is ensured through gravimetric measurement and dissolving of certified reference material/s (traceable to SI) from laboratories/producers, accredited according to ISO 17034.
The measurement results are traceable to SI. All analytical balances used for the preparation of the solution are calibrated yearly under an in-house procedure with class E1 and class E2 analytical weights, traceable to SI (DKD), and are checked daily.
Class A laboratory glassware is used.
The results from temperature measurement are traceable to SI. The thermometers used for solution's calibration are calibrated from an ISO 17025 accredited

laboratory. The ambient conditions are controlled with a hygrometer calibrated from an ISO 17025 accredited laboratory.
Both, purity of the starting materials and solvent, were checked using appropriate analytical instrument.

Intended use: ***For Laboratory Use Only***
This CRM is intended for:
Calibration of TLC, GC/FID, GC/TCD, GC/ECD, GC/MS, GC/MS/MS, LC/UV, LC/MS and LC/MS/MS
Validation of analytical methods
Preparation of “working reference samples”
Detection limit and linearity studies
This statement is not intended to restrict the use for other purposes.

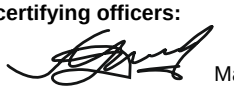
Instructions for the correct use of this certified reference material:
This CRM can be used directly or can be diluted in an appropriate solvent. Only a clean class A glassware should be used. Do not pipet from container. Obtained concentration (in mg/l) after dilution is a result from the multiplication of certified value of CRM concentration and the CRM's volume used for dilution and divided into the flask's volume used for dilution. For quantitative analysis, we recommend analyzing this mixture separately, without mixing it with other solutions, to ensure accurate results for every compound.

Stability and storage:
This CRM is with a guaranteed stability until ±5% of the certified concentration for a period of 24 months. Stability is guaranteed of an unopened original packaging stored, as written in the section: Storage Conditions. Even if the product is stable at normal laboratory conditions, in order to increase its stability, we highly recommend it to be stored in a refrigerator.
The product should be used shortly after opening to avoid concentration changes due to evaporation. Warranty does not apply to a product stored after opening.

Hazardous situation:
The normal laboratory safety precautions should be observed when working with this RM. Further details for the handling of this RM are available in a safety data sheet.

Level of homogeneity
This solution was mixed according to an in-house procedure (MQP 5.13.1) and is guaranteed to be homogeneous.
To ensure sufficient homogeneity of the sample prior to use thoroughly mix by inversion or sonicate.

Names of certifying officers:

Laboratory:  Margarita Dimitrova

Manager:  Krassimira Taralova

This document QF 5.17.1/1 version 1 is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO 33401 , ISO 33405,and Eurachem / CITAC Guides

This certificate relates solely to the lot number given above.
All processes (including generating of this certificate) are completely controlled by the specialized Computer-Aided-Manufacturing (CAM) software.

This Certified Reference Material was produced under a quality management system that is:
- Registered to ISO 9001 Quality Management System (Lloyd's Register Quality Assurance Ltd Cert No 0039638)
- Accredited according to ISO/IEC 17025
- Accredited according to ISO 17034

Additional Information

Analytical Data:

GC Conditions:

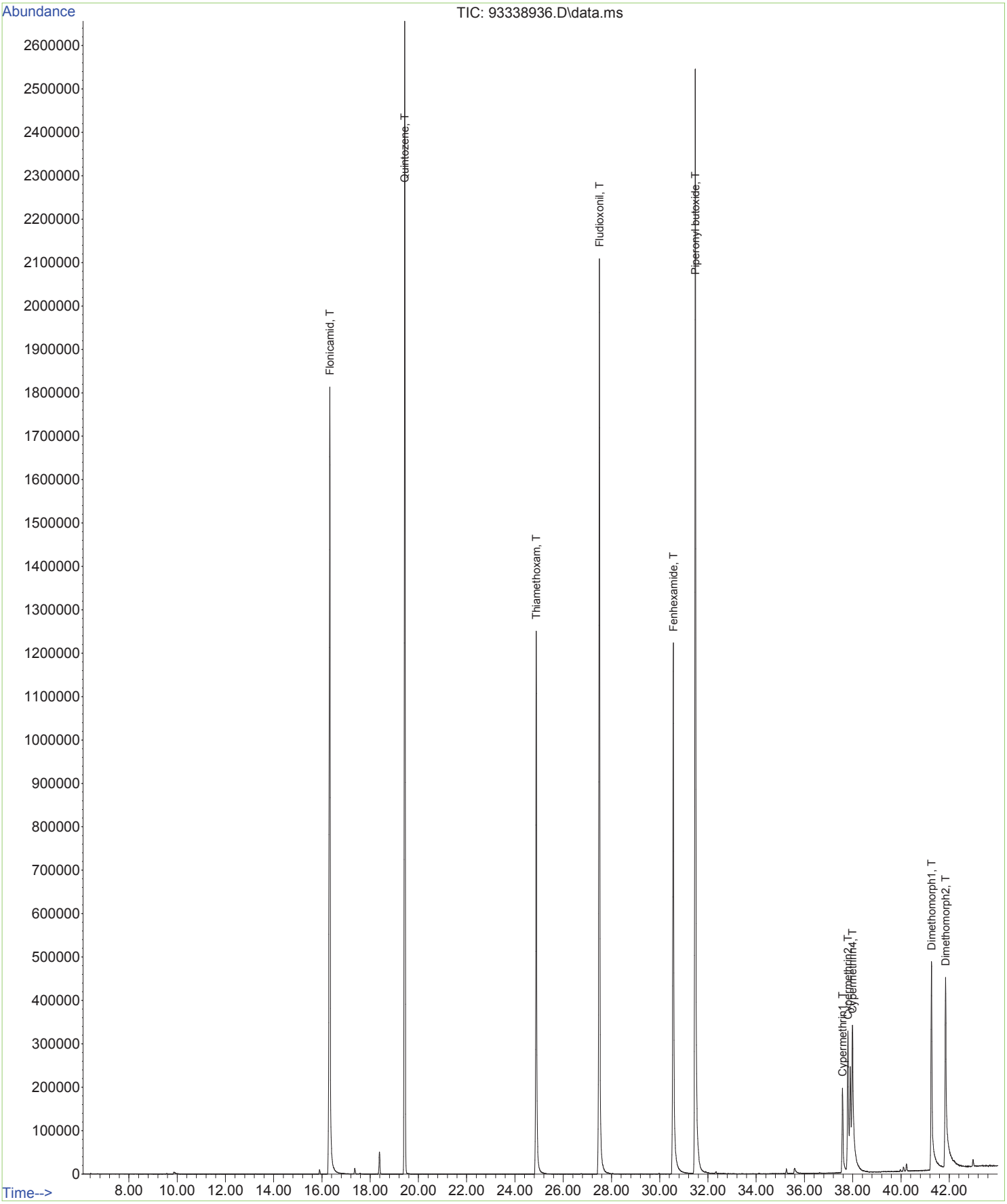
Column	PerkinElmer Elite 5-MS 30m, 0.25mm, 0.25µm	Oven	Temperature	Hold
Flow rate	1.0 ml/min	Initial	50°C	1
Injector	250 °C	25°C/min	100°C	0
Injection volume	1µl split (split ratio 10:1)	5°C/min	300°C	1
Carrier gas	He, constant flow			

MS Conditions:

Transfer line	250°C	Ionization mode	EI
MS Source	230°C	Mode	Scan
MS Quad	150°C		

Gravimetric Data

Component	Purity %	Source Lot No	Weighed quantity, g	Final quantity, $kg.10^{-3}$	Bulk/ Standard Solution lot No	Concen-tration mg/kg	Chemist ID
Cypermethrin	97.19	41583890	0.06618	3.0705	94151329	20947.8	DG
		94151329	0.954	15.8348	93338936	1262.06	KR
Dimethomorph	98.3	41562758	0.02036	15.8348	93338936	1263.91	KR
Fenhexamid	99.04	41599655	0.02023	15.8348	93338936	1265.30	KR
Flonicamid	99.71	41606261	0.02003	15.8348	93338936	1261.27	KR
Fludioxonil	99.9	41567074	0.02029	15.8348	93338936	1280.08	KR
Piperonyl butoxide	91.4	41573068	0.1124	2.3127	94131246	44421	AS
		94131246	0.4552	15.8348	93338936	1276.96	KR
Thiamethoxam	99.9	41564431	0.02001	15.8348	93338936	1262.41	KR
Quintozene	95.6	41532164	0.02091	15.8348	93338936	1262.41	KR


Abundance
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Flonicamid, T
Quintozene, T
Thiamethoxam, T
Fludioxonil, T
Fenhexamide, T
Piperonyl butoxide, T
Cypermethrin1, T
Cypermethrin2, T
Cypermethrin3, T
Cypermethrin4, T
Dimethomorph1, T
Dimethomorph2, T
Time-->