National Certified Reference Material (NCRM)

Code: GBW06168

Certificate of Certified Reference Material

Purity of Thiacloprid

Batch Number：

Certification Date：

Period of Validity：

Reference Material Producer：National Institute of Metrology
Address：No.18, Bei San Huan Dong Lu, Chaoyang Dist, Beijing
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Version：1.0

The present CRM mainly applies to pesticide detection in food and other fields, quality control of the producers and testing laboratories, calibration of analytical instruments, verification and validation of measurement methods, etc.

1. Sample preparation

The material of the CRM is pure thiacloprid, formula: $C_{10}H_9ClN_4S$, CAS number: 111988-49-9. The candidate of reference material was bought from commercial supplier. It was sub-packaged into clean brown glass vials under room temperature.

2. Traceability and certifying

Candidate material was characterized by UV spectroscopy, IR spectroscopy, mass spectrometry and nuclear magnetic resonance. Mass balance and qNMR methods was used to assign value of the CRM. In mass balance, high performance liquid chromatography with diode array detector (HPLC-DAD) was used to determine the main component. Water was determined by Karl-fisher method. Total non-volatiles/inorganics were determined by ICP-MS and IC method. Volatile solvents were determined by HS-GC-FID methods. In qNMR, the value was traced to internal standard dimethyl sulfone (GBW06119). By using the certified/calibrated mass and volume measuring instruments, the property value can be traced to the SI unit kilogram (kg), and mole.

3. Property Value and Uncertainty

The property value and expanded uncertainty are as follows:

Code	Name	Property value	Relative uncertainty (%) (k=2)
GBW06168	Purity of Thiacloprid	99.7%	0.3%

The coverage factor was chosen to obtain an approximate 95% level of confidence. The uncertainty evaluation considered sources from characterization, between-unit homogeneity and stability.

4. Homogeneity and stability

According to national technical specification of JJF1343 (equivalent to ISO Guide 35), homogeneity and stability study for this certified reference material were carried out through random sampling of sub-packaged samples followed by HPLC-DAD method. The results demonstrated good homogeneity and stability 20°C for long-term stability.

The period of validity of this CRM is 36 months since the date of certification. The stability of this CRM is regularly monitored by NIM, during this period the customer will be informed of any change of the certified value just-in-less-time.

5. Packaging, storage and using

Packaging: The CRM is packaged in clean brown glass vial plastic inner lid and screw cap. Each vial contains no less than 100 mg of sample.

Storage and transportation: The CRM should be kept in dark, room temperature, away from light.

Use: The CRM should be sealed as soon as possible after sampling.

Caution: The CRM is toxic and harmful, pay attention to avoid inhalation or contact with skin when using the material.

6. Reference

1. Li, X.; Tu, M.; Yang, B.; Ma, W.; Li, H., Structurally related impurity profiling of thiacloprid by orbitrap and de novo identification tool. *Microchem. J.* **2023**, *193*, 109123. https://doi.org/10.1016/j.microc.2023.109123

2. Li, X.; Tu, M.; Yang, B.; Ma, W.; Li, H., Corrigendum to "Structurally related impurity profiling of thiacloprid by orbitrap and de novo identification tool" [Microchem. J. 193 (2023) 109123]. *Microchem. J.* **2024**, *198*, 109592. https://doi.org/10.1016/j.microc.2023.109592

3. Tu, M.; Zhang, W.; Zhu, Y.; Ma, W.; Li, X.; Zhou, S.; Li, H.; Li, X., Accurate quantification of pure thiacloprid with mass balance and quantitative H-NMR. *J. Anal. Test.* **2024**, *8* (1), 1-8. https://doi.org/10.1007/s41664-023-00293-9

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