

Drinking Water Standards

Your essential resource for Agilent ULTRA chemical standards





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About Agilent standards

Agilent is a global leader in chromatography and spectroscopy, as well as an expert in chemical standards manufacturing. Agilent offers certified reference materials, QC standards, reagents, and buffers to complement our extensive line of instruments, columns, sample preparation products, consumables, and services. Our portfolio provides laboratories with full workflow solutions for efficient, accurate results.

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With over 40 years of technical expertise in measurement science, we provide innovative, quality products to address the entire analytical chemistry workflow for laboratories around the world.

Products

- Certified reference materials (CRM)
- Reference materials (RM)
- Calibration standards
- IQ/OQ/PQ standards
- Linearity standards
- Quality check samples
- Buffers and reagents
- Wash solution and diluents

Markets

Environmental

- Petrochemicals
- PCB/PBB
- Halocarbons
- VOC/Semi-VOC
- Pesticides
- Dioxins and furans

Food and Beverages

- Allergens
- Amino and nitroaromatics
- Pharma and vet drugs
- PAHs
- Lipids
- Food authenticity
- Phenols
- Dyes

Life Science

- Pharmaceutical
- Biopharma
- Academic and research
- University
- Governmental

Industrial and Mining

Petrochemical

- Matrix oils
- Metals in biodiesel
- Organometallic

Elemental Analysis

- Single element
- Multi-element

Custom products

Do you need a custom defined reference material or other chemical solution unique to your laboratory or testing procedure? If the product you require is not available as an Agilent product, we can prepare it for you on a custom basis. Custom reference materials are a fast, economical way to meet your specific laboratory needs.

Agilent maintains an expansive compatibility database, integrating 40 years of manufacturing and quality control data to create stable and reliable custom product formulations. Choose from any of our three quality control validation levels (see Page 4).

Visit www.agilent.com/chem/standards to request a quote.

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Agilent operates an ISO 17025 accredited quality control laboratory and is accredited to ISO Guide 34 as a reference material producer for the manufacture of certified reference materials (CRM).

Rely on the expertise of our applications development group for:

- Method development
- Pre- and postfill analysis
- Stability testing and protocols
- Homogeneity testing



Quality control validation levels

Chemical standards manufactured by Agilent are supplied with a lot-specific certificate of analysis (C of A) that reflects the associated quality control validation level. Certificates of analysis can ship with the product and are available online. All Agilent products, unless otherwise stated, are Level II - ISO Guide 34 reference materials.

| | | Reported Value | Reported Uncertainty | Former Name | Solutions | Neats | Lead Time (Customs) |
|-----------|-----------------|-------------------|----------------------|-----------------|-----------|-------|------------------------|
| Level I | ISO Guide 34 RM | True (calculated) | U_{char} | Gravimetric | Y | Y | 5 business days |
| Level II | ISO Guide 34 RM | True (analytical) | U_{char} | Full validation | Y | Y | 7 to 10 business days |
| Level III | ISO Guide 34 | Certified | U_{exp} | ISO Guide 34 | Y | | 15 to 20 business days |

Level I solution: A reference material (RM) prepared gravimetrically in accordance with ISO Guide 34 and under the Agilent ISO 9001 registered quality system. The neat materials used for the product are verified by an Agilent ISO 17025 laboratory and under the Agilent ISO Guide 34 accreditation. For each analyte, the true value, with its uncertainty value calculated at 95% confidence level, is reported.

Level I neat: RM prepared in accordance with ISO Guide 34 and under the Agilent ISO 9001 registered quality system. The true value (% purity) is reported.

Level II solution: RM prepared gravimetrically in accordance with ISO Guide 34 and under the Agilent ISO 9001 registered quality system. The neat materials used for the product are verified by an Agilent ISO 17025 laboratory and under the Agilent ISO Guide 34 accreditation. The analyte concentrations are verified by an Agilent ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at 95% confidence level, is reported.

Level II neat: RM prepared in accordance with ISO Guide 34 and under the Agilent ISO 9001 registered quality system. The materials used for this product are verified by the Agilent ISO 17025 laboratory and under the Agilent ISO Guide 34 accreditation. The true value (% purity), with its uncertainty value calculated at 95% confidence level, is reported.

Level III solution: RM prepared gravimetrically in accordance with ISO Guide 34 and under the Agilent ISO 9001 registered quality system. The neat materials used for this product are verified by the Agilent ISO 17025 laboratory and under the Agilent ISO Guide 34 accreditation. The analyte concentrations are verified by an Agilent ISO 17025 accredited laboratory. For each analyte, the certified value is reported with its uncertainty value calculated as the expanded uncertainty, in accordance with ISO Guide 35.

Triple certification

Agilent is committed to product integrity by offering customers the assurance of triple certification to ISO standards.

Agilent operates under an ISO 9001 registered quality management system, where an accrediting body (TUV) attests to the quality of our methods, procedures, testing, production, and record keeping.

Our quality control laboratory is accredited to ISO 17025 (ANAB) for technical competence to perform testing of organic and inorganic materials and certified reference materials, as defined in our scope, accessible online at www.agilent.com/chem/17025


Agilent is further accredited to ISO Guide 34 (ANAB) for technical competence as a reference material producer of certified reference materials. This requires Agilent to identify and document the major components of uncertainty including homogeneity, short- and long-term stability, and uncertainty due to analytical characterization and manufacturing.

The most current Agilent certifications are accessible at www.agilent.com/quality

Tips and tools

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Level 2 reference material Certificate of Analysis



Certificate of Analysis ISO Guide 34

C4-C24 Even Carbon Saturated FAME Mix

Product Number: 5191-4278

Page: 1 of 1

Lot Number: CR-5364

Lot Issue Date: 17-Nov-2017

Expiration Date: 31-Dec-2019

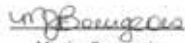
This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with Agilent's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.


| Analyte | CAS# | Analyte Lot | True Value |
|---------------------------------|-------------|-------------|----------------|
| methyl butanoate | 000623-42-7 | RM04575 | 1005 ± 5 µg/mL |
| methyl hexanoate | 000106-70-7 | NT01630 | 1005 ± 5 µg/mL |
| methyl octanoate | 000111-11-5 | NT01094 | 1003 ± 5 µg/mL |
| methyl decanoate | 000110-42-9 | NT00187 | 1004 ± 5 µg/mL |
| methyl laurate | 000111-82-0 | NT01095 | 1003 ± 5 µg/mL |
| methyl tetradecanoate | 000124-10-7 | NT00188 | 1003 ± 5 µg/mL |
| methyl palmitate | 000112-39-0 | RM07128 | 1001 ± 5 µg/mL |
| methyl octadecanoate | 000112-61-8 | RM12285 | 1002 ± 5 µg/mL |
| methyl arachidate | 001120-28-1 | RM11588 | 1003 ± 5 µg/mL |
| methyl docosanoate | 000929-77-1 | NT01096 | 1004 ± 5 µg/mL |
| tetracosanoic acid methyl ester | 002442-49-1 | NT01097 | 1004 ± 5 µg/mL |

Matrix: hexane


Storage: Store Refrigerated (2° - 8°C).

Agilent uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.


 Monica Bourgeois
 QMS Representative


ISO Guide 34 Cert No.
AR-1936

Produced in accordance with TUV USA Inc 56 100 18560026
registered ISO 9001 Quality Management System


ISO17025 Cert No.
AT-1937

250 Smith Street North Kingstown, Rhode Island 02852 www.agilent.com/quality

An example of a Certificate of Analysis for an Agilent reference material.

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Agilent is a certified GHS author for SDS and GHS compliant labeling. Chemical products manufactured and distributed by Agilent are compliant with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Safety Data Sheets (SDS) and labels are prepared in accordance with regulations and in the following languages:

European CLP Regulation

Regulation 1272/2008

- Chinese (standard Mandarin)
- Czech
- Danish
- Dutch
- English
- Estonian
- Finnish
- French
- German
- Italian
- Japanese
- Korean
- Polish
- Portuguese
- Romanian
- Russian
- Spanish
- Swedish

USA GHS-OSHA Regulation

Hazcom 2012

- English
- Spanish
- French

Chinese GHS Regulation

*GB/T 17519-2013 and
GB/T 16483-2008*

- Chinese (standard Mandarin)
- English

Additional languages are available upon request.

As regulations are updated and expanded, Agilent will maintain up-to-date records online at www.agilent.com

Tips and tools

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EPA Method 501

Trihalomethanes

Method 501 is a purge-and-trap method for measurement of total trihalomethanes using GC/ECD. These standards may be used for Methods 501.1, 501.2, and 501.3

Recommended Method 501 Trihalomethanes Mixtures

| Description | Analytes | Total Vol. | Part No. | Part No. | Part No. | Part No. |
|-------------------------|---|------------|------------|-----------|-------------|-------------|
| | | | 100 µg/mL | 200 µg/mL | 2,000 µg/mL | 5,000 µg/mL |
| 4 analytes, in methanol | Bromodichloromethane Bromoform Chloroform Dibromochloromethane | 1 x 1 mL | THM-501N-1 | THM-511-1 | THM-515-1 | THM-521-1 |

Performance Check Mixture

| Description | Analytes | Total Vol. | Part No. |
|---|--|--|------------------------|
| 8 analytes, at 2,000 µg/mL, in methanol | Benzene Carbon tetrachloride 1,4-Dichlorobenzene 1,2-Dichloroethane | 1,1-Dichloroethene 1,1,1-Trichloroethane Trichloroethene Vinyl chloride | 1 x 1 mL EPA 100A-1 |

Promulgated VOC Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|---|---|------------------------|
| 12 analytes, at 200 µg/mL, in methanol | Chlorobenzene 1,2-Dichlorobenzene <i>cis</i> -1,2-Dichloroethene <i>trans</i> -1,2-Dichloroethene 1,2-Dichloropropane Ethylbenzene | <i>o</i> -Xylene <i>m</i> -Xylene <i>p</i> -Xylene Styrene Tetrachloroethene Toluene | 1 x 1 mL DWM-591A-1 |

Trihalomethanes Kit

| Description | Components | Total Vol. | Part No. |
|--|--|------------------------------------|---------------------|
| Contains 5 ampoules, at 100 µg/mL, in methanol | Bromodichloromethane Bromoform plus Trihalomethanes mixture (THM-501N-1) | Chloroform Dibromochloromethane | 1 x 1 mL THK-501 |

Recommended Standards

| Method 501 | Part No. |
|-----------------------|--------------------------------------|
| Calibration standards | THM-501N-1 THM-511-1 THM-521-1 |

EPA Method 502.2

Volatile organic compounds

EPA Method 502.2 is an enhanced and expanded version of 502.1. It is a purge-and-trap GC method, but uses a capillary column to detect a more efficient separation. Detection is carried out using a photoionization detector, in series with either an electrolytic conductivity or microcoulometric detector, enabling determination of all 60 analytes of interest.

Recommended Method 502.2 VOC Mixtures

| Description | Analytes | Total Vol. | Part No. 200 µg/mL | Part No. 2,000 µg/mL | |
|-----------------------------|---|--|---|-------------------------|------------------------|
| 60 analytes, in methanol | Benzene Bromobenzene Bromochloromethane Bromodichloromethane Bromoform Bromomethane Carbon tetrachloride Chlorobenzene Chloroethane Chloroform Chloromethane 2-Chlorotoluene 4-Chlorotoluene Dibromochloromethane 1,2-Dibromo-3-chloropropane Dibromomethane 1,2-Dibromoethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene | 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene 1,1-Dichloropropene <i>cis</i> -1,2-Dichloroethene <i>trans</i> -1,2-Dichloroethene Dichlorodifluoromethane 1,2-Dichloropropane 1,3-Dichloropropane 2,2-Dichloropropane <i>cis</i> -1,3-Dichloropropene <i>trans</i> -1,3-Dichloropropene Ethylbenzene Hexachlorobutadiene Isopropylbenzene 4-Isopropyltoluene Methylene chloride Naphthalene <i>n</i> -Butylbenzene <i>n</i> -Propylbenzene | <i>o</i> -Xylene <i>m</i> -Xylene <i>p</i> -Xylene <i>sec</i> -Butylbenzene Styrene <i>tert</i> -Butylbenzene 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Tetrachloroethene Toluene 1,1,1-Trichloroethane 1,2,3-Trichlorobenzene 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Vinyl chloride | 1 x 1 mL | DWM-588-1 DWM-588-1 |

Individual Internal and Surrogate Standards for Method 502

| Standards | Concentration | Total Vol. | Part No. |
|---|--------------------------|------------|---|
| 2-Bromo-1-chloropropane 1,4-Dichlorobutane Fluorobenzene 1-Chloro-2-fluorobenzene | 1,000 µg/mL, in methanol | 1 x 1 mL | STS-191-1 STS-201-1 STS-161-1 STS-451-1 |
| 2-Bromo-1-chloropropane 1-Chloro-2-fluorobenzene 1,4-Dichlorobutane Fluorobenzene Methylene chloride-d ₂ | 2,000 µg/mL, in methanol | 1 x 1 mL | STS-190-1 STS-450-1 STS-200-1 STS-160-1 IST-510-1 |

Recommended Method 502.2 Internal Standard Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|--|------------|------------|
| 2 analytes, at 2,000 µg/mL, in methanol | 2-Bromo-1-chloropropane Fluorobenzene | 1 x 1 mL | STM-240N-1 |

Recommended Standards

| Method 502.2 | Part No. |
|-----------------------|------------------------|
| Calibration standards | DWM-580-1 DWM-588-1 |
| Internal standard | STM-240N-1 |

Tips and tools

Find more EPA Method standards online at www.agilent.com/chem/standards

EPA Method 503.1

Volatile aromatics and unsaturated organic compounds

Method 503.1 is applicable for the determination of volatile aromatic and unsaturated compounds. It is a purge-and-trap method, using GC with a high-temperature photoionization detector.

Recommended Method 503.1 Aromatics and Alkenes Mixture

| Description | Analytes | Total Vol. | Part No. | |
|--|---|--|----------|-----------|
| 28 analytes, at 200 µg/mL, in methanol | Benzene Bromobenzene <i>n</i> -Butylbenzene <i>sec</i> -Butylbenzene <i>tert</i> -Butylbenzene Chlorobenzene 2-Chlorotoluene 4-Chlorotoluene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Hexachlorobutadiene Isopropylbenzene | 4-Isopropyltoluene Naphthalene <i>n</i> -Propylbenzene Styrene Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene Trichloroethene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene <i>o</i> -Xylene <i>m</i> -Xylene <i>p</i> -Xylene | 1 x 1 mL | DWM-503-1 |

Aromatic Hydrocarbons Mixture

| Description | Analytes | Total Vol. | Part No. | |
|--|---|---|----------|-----------|
| 16 analytes, at 200 µg/mL, in methanol | Benzene <i>n</i> -Butylbenzene <i>sec</i> -Butylbenzene <i>tert</i> -Butylbenzene Ethylbenzene Isopropylbenzene 4-Isopropyltoluene Naphthalene | <i>n</i> -Propylbenzene Styrene Toluene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene <i>o</i> -Xylene <i>m</i> -Xylene <i>p</i> -Xylene | 1 x 1 mL | DWM-550-1 |

Halocarbons Mixture

| Description | Analytes | Total Vol. | Part No. | |
|--|---|--|----------|-----------|
| 12 analytes, at 200 µg/mL, in methanol | Bromobenzene Chlorobenzene 2-Chlorotoluene 4-Chlorotoluene 1,2-Dichlorobenzene 1,3-Dichlorobenzene | 1,4-Dichlorobenzene Hexachlorobutadiene Tetrachloroethene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene Trichloroethene | 1 x 1 mL | DWM-563-1 |

Recommended Method 503.1 Internal and Surrogate Standards

| Description | Standard | Total Vol. | Part No. 200 µg/mL | Part No. 2,000 µg/mL |
|-------------------------|------------------------|------------|-----------------------|-------------------------|
| 1 standard, in methanol | α,α,α-Trifluorotoluene | 1 x 1 mL | STS-221-1 | STS-220N-1 |

Recommended Standards

| Method 503.1 | Part No. |
|----------------------|------------|
| Calibration standard | DWM-503-1 |
| Internal standard | STS-220N-1 |

EPA Method 504, 504.1

EDB, DBCP, and 123-TCP

Method 504 is used to measure low concentrations of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB). It is an extraction method, using GC with a capillary column and electron capture detector. Method 504.1 adds 1,2,3-trichloropropane to the analyte list.

Recommended DBCP/EDB Mixtures

| Description | Analytes | Total Vol. | Part No. 200 µg/mL | Part No. 2,000 µg/mL |
|-------------------------|--|----------------------|-----------------------|-------------------------|
| 2 analytes, in methanol | 1,2-Dibromo-3-chloropropane 1,2-Dibromoethane | 1 x 1 mL 1 x 1 mL | DWM-504N-1 | HCM-812-1 |

Recommended Method 504.1 Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|--|------------|-----------|
| 3 analytes, at 200 µg/mL, in methanol | 1,2-Dibromo-3-chloropropane 1,2-Dibromoethane 1,2,3-Trichloropropane | 1 x 1 mL | DWM-514-1 |

Tips and tools

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EPA Method 505

Organohalide pesticides and Aroclors

Method 505 is used to analyze for organohalide pesticides and commercial PCBs. It is a microextraction method, using GC with a capillary column and electron capture detector.

Recommended Method 505 Organochlorine Pesticides Mixture

| Description | Analytes and Concentration | | | | Total Vol. | Part No. |
|-------------------------|----------------------------|-----------|---------------------------|-----------|------------|------------|
| 12 analytes, in acetone | Alachlor | 50 µg/mL | Heptachlor | 20 µg/mL | 1 x 1 mL | PPM-505D-1 |
| | Aldrin | 20 µg/mL | Heptachlor epoxide (B) | 20 µg/mL | | |
| | Atrazine | 500 µg/mL | Hexachlorobenzene | 10 µg/mL | | |
| | γ-BHC (lindane) | 20 µg/mL | Hexachlorocyclopentadiene | 20 µg/mL | | |
| | Dieldrin | 20 µg/mL | Methoxychlor | 200 µg/mL | | |
| | Endrin | 20 µg/mL | Simazine | 100 µg/mL | | |

Recommended Method 505 Organochlorine Pesticides Mixture

| Description | Analytes and Concentration | | | | Total Vol. | Part No. |
|-------------------------|----------------------------|-----------|---------------------------|-----------|------------|------------|
| 16 analytes, in acetone | Alachlor | 10 µg/mL | Heptachlor | 1 µg/mL | 1 x 1 mL | PPM-505E-1 |
| | Aldrin | 1 µg/mL | Heptachlor epoxide (B) | 1 µg/mL | | |
| | Atrazine | 250 µg/mL | Hexachlorobenzene | 1 µg/mL | | |
| | γ-BHC (lindane) | 1 µg/mL | Hexachlorocyclopentadiene | 1 µg/mL | | |
| | α-Chlordane | 1 µg/mL | Methoxychlor | 5 µg/mL | | |
| | γ-Chlordane | 1 µg/mL | <i>cis</i> -Nonachlor | 1 µg/mL | | |
| | Dieldrin | 1 µg/mL | <i>trans</i> -Nonachlor | 1 µg/mL | | |
| | Endrin | 1 µg/mL | Simazine | 250 µg/mL | | |

EPA Method 506

Phthalate and adipate esters

Method 506 is an extraction method, using GC with a capillary column and a photoionization detector.

Recommended Method 506 Phthalates Mixtures

| Description | Analytes | Total Vol. | Part No. 1,000 µg/mL in Isooctane | Part No. 200 µg/mL in Methanol |
|-------------|---|--|---|--------------------------------------|
| 7 analytes | Bis(2-ethylhexyl) adipate Bis(2-ethylhexyl) phthalate Butyl benzyl phthalate Di- <i>n</i> -butyl phthalate | Diethyl phthalate Dimethyl phthalate Di- <i>n</i> -octyl phthalate | 1 x 1 mL | PSM-506-1 PSM-520-1 |

Phthalates Mixture

| Description | Analytes and Concentration | Total Vol. | Part No. |
|-------------------------|---|--|-----------------------|
| 7 analytes, in methanol | Bis(2-ethylhexyl) adipate 1,200 µg/mL Bis(2-ethylhexyl) phthalate 250 µg/mL Butyl benzyl phthalate 250 µg/mL Di- <i>n</i> -butyl phthalate 100 µg/mL | Diethyl phthalate 100 µg/mL Dimethyl phthalate 100 µg/mL Di- <i>n</i> -octyl phthalate 650 µg/mL | 1 x 1 mL PSM-516-1 |

Phthalate Mixture

| Description | Analytes | Total Vol. | Part No. |
|---|---|------------|-----------|
| 2 analytes, at 100 µg/mL, in acetone | Butyl benzyl phthalate Di- <i>n</i> -butyl phthalate | 1 x 1 mL | PSM-510-1 |

Phthalates Mixture

| Description | Analytes | Total Vol. | Part No. |
|---|---|--|-----------------------|
| 8 analytes, at 1,000 µg/mL, in isooctane | Bis(2-ethylhexyl) adipate Bis(2-ethylhexyl) phthalate Butyl benzyl phthalate Diethyl phthalate | Diisobutyl phthalate Dimethyl phthalate Di- <i>n</i> -butyl phthalate Di- <i>n</i> -octyl phthalate | 1 x 1 mL PSM-516-1 |

Phthalates Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|---|--|-----------------------|
| 8 analytes, at 1,000 µg/mL in isooctane | Bis(2-ethylhexyl) adipate Bis(2-ethylhexyl) phthalate Butyl benzyl phthalate Diethyl phthalate | Diisobutyl phthalate Dimethyl phthalate Di- <i>n</i> -butyl phthalate Di- <i>n</i> -octyl phthalate | 1 x 1 mL PSM-516-1 |

Recommended Standard

| Method 506 | Part No. |
|----------------------|-----------|
| Calibration standard | PSM-506-1 |

EPA Method 507

Nitrogen and phosphorus containing pesticides

Method 507 is used to determine nitrogen and phosphorus containing pesticides. It is an extraction method, using GC with a capillary column and a nitrogen-phosphorus detector.

Recommended Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|-----------------------------------|-----------------------------------|-----------------------|
| 6 analytes, at 1,000 µg/mL, in methyl <i>tert</i> -butyl ether | Ametryn Cycloate Disulfoton | Fenamiphos Merphos Prometon | 1 x 1 mL NPM-101-1 |

Recommended Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|---|--|-----------------------|
| 9 analytes, at 1,000 µg/mL, in methyl <i>tert</i> -butyl ether | Atrazine Diphenamid EPTC Ethoprop Mevinphos | Prometryn Propazine Terbutryn Triadimefon | 1 x 1 mL NPM-102-1 |

Recommended Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|--|--|-----------------------|
| 9 analytes, at 1,000 µg/mL, in methyl <i>tert</i> -butyl ether | Butachlor Carboxin Diazinon Metolachlor MGK-264, mixed isomers | Metribuzin Norflurazon Terbufos Vernolate | 1 x 1 mL NPM-103-1 |

Recommended Method 507 Surrogate Standard Solution

| Standard | Concentration | Total Vol. | Part No. |
|-----------------------------|--|------------|-----------|
| 1,3-Dimethyl-2-nitrobenzene | 250 µg/mL, in methyl <i>tert</i> -butyl ether | 1 x 1 mL | PPS-100-1 |

Recommended Method 507 Internal Standard Solution

| Standard | Concentration | Total Vol. | Part No. |
|---------------------------|--|------------|-----------|
| Triphenyl phosphate (TPP) | 500 µg/mL, in methyl <i>tert</i> -butyl ether | 1 x 1 mL | PPS-110-1 |

Tips and tools

Find more EPA Method standards online at
www.agilent.com/chem/standards

EPA Method 508, 508.1

Chlorinated pesticides

Methods 508 and 508.1 are used to determine chlorinated pesticides. They are extraction methods, using GC with a capillary column and electron capture detector.

Recommended Method 508 Organochlorine Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|---|--|--|------------------------|
| 17 analytes, at 1,000 µg/mL, in methyl <i>tert</i> -butyl ether | Aldrin α-BHC (α-HCH) β-BHC (β-HCH) δ-BHC (δ-HCH) γ-BHC (γ-HCH) 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin | Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Heptachlor Heptachlor epoxide (B) Methoxychlor | 1 x 1 mL PPM-508B-1 |

Recommended Method 508 Internal Standard Solution

| Standard | Concentration | Total Vol. | Part No. |
|--------------------------------|---|------------|-----------|
| Pentachloronitrobenzene (PCNB) | 100 µg/mL, in methyl <i>tert</i> -butyl ether | 1 x 1 mL | PPS-130-1 |

Recommended Method 508 Surrogate Standard Solution

| Standard | Concentration | Total Vol. | Part No. |
|----------------------------|---|------------|-----------|
| 4,4-Dichlorobiphenyl (DCB) | 500 µg/mL, in methyl <i>tert</i> -butyl ether | 1 x 1 mL | PPS-120-1 |

EPA Method 508A

Polychlorinated biphenyls

Method 508A is used to screen for PCBs. It is an extraction method, using GC with either a packed or a capillary column, and an electron capture detector.

Aroclor 1260 Stock Solutions

| Description | Solution | Total Vol. | Part No. 1,000 µg/mL | Part No. 5,000 µg/mL |
|-------------------------|--------------|------------|-------------------------|-------------------------|
| 1 solution, in methanol | Aroclor 1260 | 1 x 1 mL | PPS-141-1 | PPS-140-1 |

Decachlorobiphenyl Stock Solution

| Description | Solution | Total Vol. | Part No. |
|--|--------------------|------------|-----------|
| 1 solution, at 1,000 µg/mL, in toluene | Decachlorobiphenyl | 1 x 1 mL | PPS-150-1 |

EPA Method 509

Ethylene Thiourea (ETU)

Method 509 is used to determine ethylene thiourea (ETU). Samples are passed through a column of diatomaceous earth and analyzed using capillary column gas chromatography with a nitrogen-phosphorus detector.

Method 509 Internal Standard

| Description | Standard | Total Vol. | Part No. |
|---|--------------------------------------|------------|-----------|
| 1 standard, at 1,000 µg/mL, in 0.1% w/v DTT in ethyl acetate | 3,4,5,6-Tetrahydro-2-pyrimidinethiol | 1 x 1 mL | IST-800-1 |

Free Radical Scavenger Solution

| Description | Solution | Total Vol. | Part No. |
|--|----------------|------------|------------|
| 1 solution, at 1,000 mg/L, in ethyl acetate | Dithiothreitol | 1 x 1 mL | EPA-1390-1 |

Method 509 Stock Standard

| Description | Standard | Total Vol. | Part No. 100 µg/mL | Part No. 1,000 µg/mL |
|---|-------------------|------------|-----------------------|-------------------------|
| 1 standard, in 0.1% w/v DTT in ethyl acetate | Ethylene thiourea | 1 x 1 mL | PPS-640-1 | PPS-641-1 |

Instrument Performance Check Solution

| Description | Analytes and Concentration | Total Vol. | Part No. |
|---|--------------------------------------|-------------|----------|
| 3 analytes, in 0.1% w/v DTT in ethyl acetate | Ethylene thiourea | 10 ng/mL | 1 x 1 mL |
| | Propylene thiourea | 100 ng/mL | |
| | 3,4,5,6-Tetrahydro-2-pyrimidinethiol | 1,000 ng/mL | |

Method 509 Surrogate Standard

| Description | Standard | Total Vol. | Part No. |
|---|--------------------|------------|-----------|
| 1 standard, at 100 µg/mL, in 0.1% w/v DTT in ethyl acetate | Propylene thiourea | 1 x 1 mL | PPS-642-1 |

EPA Method 515.1, 515.2, 515.3, 515.4

Chlorinated acids

Methods 515.1 and 515.2 are used to determine chlorinated acids. These methods involve extraction followed by derivatization, using GC with a capillary column and electron capture detector.

Recommended Method 515.1 Chlorinated Herbicides Mixtures

| Description | Analytes and Concentration | | | | Total Vol. | Mixture | Part No. |
|-------------|----------------------------|-------------|--------------------------|-----------|------------|--|-------------|
| 16 analytes | Acifluorfen | 100 µg/mL | 3,5-Dichlorobenzoic acid | 100 µg/mL | 1 x 1 mL | Acids mixture in methyl <i>tert</i> -butyl ether | HBM-5155A-1 |
| | Bentazon | 200 µg/mL | Dichlorprop | 300 µg/mL | | | |
| | Chloramben | 100 µg/mL | Dinoseb | 200 µg/mL | | | |
| | 2,4-D | 200 µg/mL | 4-Nitrophenol | 100 µg/mL | | | |
| | Dalapon | 1,300 µg/mL | Pentachlorophenol | 100 µg/mL | | | |
| | 2,4-DB | 800 µg/mL | Picloram | 100 µg/mL | | | |
| | Dacthal (DCPA) | 100 µg/mL | Silvex (2,4,5-TP) | 100 µg/mL | | | |
| | Dicamba | 100 µg/mL | 2,4,5-T | 100 µg/mL | | | |

Recommended Method 515.1 Surrogate Standard Solutions

| Description | Solutions | Total Vol. | Part No. |
|--|--------------------------------------|------------|-----------|
| 2 solutions, 100 µg/mL, in methyl <i>tert</i> -butyl ether | 2,4-Dichlorophenylacetic acid (DCAA) | 1 x 1 mL | PPS-160-1 |
| | DCAA methyl ester | | PPS-161-1 |

Recommended Standards

| Method 515.1 | Part No. | Method 515.2 | Part No. | Method 515.3 | Part No. | Method 515.4 | Part No. |
|----------------------|------------------------|-----------------------|----------------------------|-----------------------|----------------------------|----------------------|------------------------|
| Calibration standard | HBM-5155A-1 | Calibration standards | HBM-5152A-1 HBM-5153A-1 | Calibration standards | HBM-5156A-1 HBM-5156M-1 | Calibration standard | HBM-5157A-1 |
| Internal standards | PPS-170-1 PPS-169-1 | Internal standard | PPS-172-1 | Internal standards | PPS-174-1 PPS-170-1 | Internal standard | PPS-174-1 |
| Surrogate standard | PPS-160-1 | Surrogate standard | PPS-162-1 | Surrogate standards | PPS-167-1 PPS-168-1 | Surrogate standards | PPS-167-1 PPS-168-1 |

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EPA Method 521

Nitrosamines

Method 521 is used to determine nitrosamines. It uses solid phase extraction and GC/MS.

Nitrosamines Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|---|------------|-----------|
| 9 analytes, 2,000 µg/mL, in methylene chloride | <i>N</i> -Nitrosodi- <i>n</i> -butylamine <i>N</i> -Nitrosodiethylamine <i>N</i> -Nitrosodimethylamine <i>N</i> -Nitrosodiphenylamine <i>N</i> -Nitrosodi- <i>n</i> -propylamine <i>N</i> -Nitrosomethylethylamine <i>N</i> -Nitrosomorpholine <i>N</i> -Nitrosopiperidine <i>N</i> -Nitrosopyrrolidine | 1 x 1 mL | US-113N-1 |

Recommended Method 521 Surrogate and Internal Standards

| Description | Standards | Total Vol. | Part No. 100 µg/mL | Part No. 1,000 µg/mL |
|------------------------------------|--|------------|-----------------------|-------------------------|
| 2 standards, in methylene chloride | <i>N</i> -Nitrosodimethylamine- d_6 | 1 x 1 mL | | IST-760-1 |
| | <i>N</i> -Nitrosodi- <i>n</i> -propylamine- d_{14} | 1 x 1 mL | IST-771-1 | IST-770-1 |

EPA Method 523

Triazine pesticides

Method 523 is used to determine triazine pesticides and their degradation products. It is a solid phase extraction method, using GC/MS with a capillary column.

Method 523 Stock Standards

| Compound | Concentration | Volume | Part No. |
|--------------------------------|------------------------------|----------|-----------------|
| Ametryn | 1200 µg/mL, in ethyl acetate | 1 x 1 mL | PST-024Y1200 |
| Atrazine | 2000 µg/mL, in ethyl acetate | | PST-005Y2000 |
| Atrazine-desethyl | 1000 µg/mL, in ethyl acetate | | PST-4010Y1000 |
| Atrazine-desethyl desisopropyl | 100 µg/mL, in ethyl acetate | | PST-6935Y100A01 |
| Atrazine-desisopropyl | 500 µg/mL, in ethyl acetate | | PST-4005Y500 |
| Cyanazine | 2000 µg/mL, in ethyl acetate | | PST-1360Y2000 |
| Prometon | 1200 µg/mL, in ethyl acetate | | PST-830Y1200 |
| Prometryn | 900 µg/mL, in ethyl acetate | | PST-840Y900 |
| Propazine | 2000 µg/mL, in ethyl acetate | | PST-850Y2000 |
| Simazine | 500 µg/mL, in ethyl acetate | | PST-1130Y500 |
| Simetryn | 840 µg/mL, in ethyl acetate | | PST-1805Y840 |
| Terbuthylazine | 2000 µg/mL, in ethyl acetate | | PST-1705Y2000 |
| Terbuthylazine-desethyl | 850 µg/mL, in ethyl acetate | | PST-6850Y850 |

EPA Method 524.2, 524.3, 524.4

Purgeable organic compounds

Method 524.2 is a purge-and-trap GC/MS method allowing determination of all VOCs, using a capillary column.

Recommended Method 524.2 VOC Mixtures

| Description | Analytes | Total Vol. | Part No. 200 µg/mL | Part No. 2,000 µg/mL |
|-----------------------------|-----------------------------|-----------------------------------|---------------------------|------------------------------------|
| 60 analytes, in methanol | Benzene | 1,2-Dichlorobenzene | Naphthalene | 1 x 1 mL DWM-580-1 DWM-588-1 |
| | Bromobenzene | 1,3-Dichlorobenzene | <i>n</i> -Propylbenzene | |
| | Bromochloromethane | 1,4-Dichlorobenzene | Styrene | |
| | Bromodichloromethane | Dichlorodifluoromethane | 1,1,1,2-Tetrachloroethane | |
| | Bromoform | 1,1-Dichloroethane | 1,1,2,2-Tetrachloroethane | |
| | Bromomethane | 1,2-Dichloroethane | Tetrachloroethene | |
| | <i>n</i> -Butylbenzene | 1,1-Dichloroethene | Toluene | |
| | <i>sec</i> -Butylbenzene | <i>cis</i> -1,2-Dichloroethene | 1,2,3-Trichlorobenzene | |
| | <i>tert</i> -Butylbenzene | <i>trans</i> -1,2-Dichloroethene | 1,2,4-Trichlorobenzene | |
| | Carbon tetrachloride | 1,2-Dichloropropane | 1,1,1-Trichloroethane | |
| | Chlorobenzene | 1,3-Dichloropropane | 1,1,2-Trichloroethane | |
| | Chloroethane | 2,2-Dichloropropane | Trichloroethene | |
| | Chloroform | 1,1-Dichloropropene | Trichlorofluoromethane | |
| | Chloromethane | <i>cis</i> -1,3-Dichloropropene | 1,2,3-Trichloropropane | |
| | 2-Chlorotoluene | <i>trans</i> -1,3-Dichloropropene | 1,2,4-Trimethylbenzene | |
| | 4-Chlorotoluene | Ethylbenzene | 1,3,5-Trimethylbenzene | |
| | Dibromochloromethane | Hexachlorobutadiene | Vinyl chloride | |
| | 1,2-Dibromo-3-chloropropane | Isopropylbenzene | <i>o</i> -Xylene | |
| | 1,2-Dibromoethane | 4-Isopropyltoluene | <i>m</i> -Xylene | |
| | Dibromomethane | Methylene chloride | <i>p</i> -Xylene | |

Recommended Method 524.2 VOC Mixture – Rev. 4.1 Addition

| Description | Analytes | Total Vol. | Part No. |
|---|-------------------------------------|---------------------------------|-----------------------|
| 24 analytes, at 2,000 µg/mL, in methanol | Acetone | 2-Hexanone | 1 x 1 mL DWM-592-1 |
| | Acrylonitrile | Methacrylonitrile | |
| | Allyl chloride | Methyl acrylate | |
| | 2-Butanone (MEK) | Methyl iodide | |
| | Carbon disulfide | Methyl methacrylate | |
| | Chloroacetonitrile | 4-Methyl-2-pentanone | |
| | 1-Chlorobutane | Methyl <i>tert</i> -butyl ether | |
| | <i>trans</i> -1,4-Dichloro-2-butene | Nitrobenzene | |
| | 1,1-Dichloro-2-propanone | 2-Nitropropane | |
| | Diethyl ether | Pentachloroethane | |
| | Ethyl methacrylate | Propionitrile | |
| | Hexachloroethane | Tetrahydrofuran | |

Recommended Method 524.2 Internal and Surrogate Standard Mixtures

| Description | Analytes | Total Vol. | Part No. 1,000 µg/mL | Part No. 2,000 µg/mL |
|----------------------------|--|------------|-------------------------|-------------------------|
| 3 analytes, in methanol | 1,2-Dichlorobenzene- <i>d</i> ₄ | 1 x 1 mL | STM-321-1 | STM-320N-1 |
| | 4-Bromofluorobenzene | | | |
| | Fluorobenzene | | | |

Recommended Standards

| EPA Method 524.2, 524.3, 524.4 | Part No. |
|----------------------------------|------------|
| Calibration standards | DWM-580-1 |
| | DWM-588-1 |
| | DWM-592-1 |
| Internal and surrogates standard | STM-320N-1 |



DWM-580-1

Safe Drinking Water Act

Phase II, phase V, and phase VIB standards

These standards are ideal for analysis of regulated compounds under the Safe Drinking Water Act (SDWA).

SDWA Volatiles Mixture

| Description | Analytes | Total Vol. | Part No. | |
|--|--|--|----------|-----------|
| 27 analytes, at 2,000 µg/mL, in methanol | Benzene Bromodichloromethane Bromoform Carbon tetrachloride Chlorobenzene Chloroform Dibromochloromethane 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethene <i>cis</i> -1,2-Dichloroethene <i>trans</i> -1,2-Dichloroethene 1,2-Dichloropropane | Ethylbenzene Methylene chloride Styrene Tetrachloroethene Toluene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Vinyl chloride <i>o</i> -Xylene <i>m</i> -Xylene <i>p</i> -Xylene | 1 x 1 mL | DWM-594-1 |

Regulated VOC Mixture

| Description | Analytes | Total Vol. | Part No. | |
|--|--|---|----------|-----------|
| 12 analytes, at 2,000 µg/mL, in methanol | Benzene Bromodichloromethane Bromoform Carbon tetrachloride Chloroform Dibromochloromethane | 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethene 1,1,1-Trichloroethane Trichloroethene Vinyl chloride | 1 x 1 mL | DWM-590-1 |

SDWA SOCs Mixture

| Description | Analytes | Total Vol. | Part No. | |
|--------------------------------------|---|--|----------|-----------|
| 6 analytes, at 500 µg/mL, in acetone | Benzo[<i>a</i>]pyrene Bis(2-Ethylhexyl) adipate Bis(2-Ethylhexyl) phthalate | Hexachlorobenzene Hexachlorocyclopentadiene Pentachlorophenol (at 2,000 µg/mL) | 1 x 1 mL | SVM-500-1 |

Phase V Additions VOC Mixture

| Description | Analytes | Total Vol. | Part No. |
|---|---|------------|------------|
| 3 analytes, at 2,000 µg/mL, in methanol | Methylene chloride 1,1,2-Trichloroethane 1,2,4-Trichlorobenzene | 1 x 1 mL | DWM-593A-1 |

EPA Method 525.1

Organic compounds

Method 525.1 is used to determine SOCs. It is a liquid-solid extraction method, using GC/MS with a capillary column.

Recommended Method 525.1 PAH Mixtures

| Description | Analytes | Total Vol. | Part No. 100 µg/mL | Part No. 500 µg/mL |
|----------------------------|--|---|-----------------------|------------------------|
| 13 analytes, in acetone | Acenaphthylene Anthracene Benz[<i>a</i>]anthracene Benzo[<i>b</i>]fluoranthene Benzo[<i>k</i>]fluoranthene Benzo[<i>ghi</i>]perylene Benzo[<i>a</i>]pyrene | Chrysene Dibenz[<i>a,h</i>]anthracene Fluorene Indeno[1,2,3- <i>cd</i>]pyrene Phenanthrene Pyrene | 1 x 1 mL | PM-525A-1 PM-525B-1 |

Recommended Method 525.1 Organochlorine Pesticides Mixes

| Description | Analytes | Total Vol. | Part No. 100 µg/mL | Part No. 500 µg/mL |
|----------------------------|---|---|-----------------------|--------------------------|
| 12 analytes, in acetone | Alachlor Aldrin Atrazine α-Chlordane γ-Chlordane γ-BHC (lindane) | Endrin Heptachlor Heptachlor epoxide (B) Methoxychlor <i>trans</i> -Nonachlor Simazine | 1 x 1 mL | PPM-525C-1 PPM-525D-1 |

Recommended Standards

| Method 525.1 | Part No. |
|---------------------------------|--|
| Calibration standards | PM-525A-1 PPM-525C-1 PSM-525-1 RPCM-525-1 EPA-1161-1 |
| Internal and surrogate standard | ISM-310-1 |

Technical note

Although Method 525 quantifies chlordane using only three of its constituents, regulations often require chlordane to be quantified as total chlordane. For those instances, Agilent also offers standards for technical chlordane.

EPA Method 525.2

Organic compounds

Method 525.2 is used to determine SOCs. It is a liquid-solid extraction method, using GC/MS with a capillary column.

Recommended Method 525.2 Semivolatiles Mixture

| Description | Analytes | Total Vol. | Part No. | |
|---------------------------------------|--|--|---|-----------------------|
| 33 analytes, at 100 µg/mL, in acetone | Acenaphthylene Anthracene Benz[<i>a</i>]anthracene Benzo[<i>b</i>]fluoranthene Benzo[<i>k</i>]fluoranthene Benzo[<i>ghi</i>]perylene Benzo[<i>a</i>]pyrene Butyl benzyl phthalate 2-Chlorobiphenyl Chrysene Dibenz[<i>a,h</i>]anthracene | 2,3-Dichlorobiphenyl Bis(2-Ethylhexyl) adipate Bis(2-Ethylhexyl) phthalate Diethyl phthalate Dimethyl phthalate Di- <i>n</i> -butyl phthalate 2,4-Dinitrotoluene 2,6-Dinitrotoluene Fluorene Hexachlorobenzene 2,2',4,4',5,6'-Hexachlorobiphenyl | 2,2',3,3',4,4',6-Heptachlorobiphenyl Hexachlorocyclopentadiene Indeno[1,2,3- <i>cd</i>]pyrene Isophorone 2,2',3,3',4,5',6,6'-Octachlorobiphenyl 2,2',3',4,6-Pentachlorobiphenyl Pentachlorophenol (at 400 µg/mL) Phenanthrene Pyrene 2,2',4,4'-Tetrachlorobiphenyl 2,4,5-Trichlorobiphenyl | 1 x 1 mL SVM-525-1 |

Recommended Method 525.2 Organochlorine Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. | | |
|---------------------------------------|--|--|---|---|------------------------|
| 29 analytes, at 100 µg/mL, in acetone | Alachlor Aldrin Atrazine α-BHC β-BHC γ-BHC (lindane) δ-BHC | Chlorobenzilate Chlorothalonil Chloroneb Dacthal (DCPA) 4,4'-DDD 4,4'-DDT 4,4'-DDE | Permethrin, mixed isomers (at 200 µg/mL) Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Etridiazole | <i>cis</i> -Chlordane <i>trans</i> -Chlordane Heptachlor Heptachlor epoxide Methoxychlor <i>trans</i> -nonachlor Simazine | 1 x 1 mL PPM-525E-1 |

Recommended Method 525.2 Nitrogen/Phosphorus Pesticide Mixtures

| Description | Analytes | Total Vol. | Part No. | |
|------------------------|------------------------------------|-----------------------------------|-----------|-------------------------|
| | | | 100 µg/mL | 1,000 µg/mL |
| 6 analytes, in acetone | Carboxin Diazinon Disulfoton | Fenamiphos Merphos Terbufos | 1 x 1 mL | NPM-525B-1 NPM-526-1 |

Recommended Method 525.2 Toxaphene Standards

| Description | Analyte | Total Vol. | Part No. | |
|-------------|-----------|------------|-------------------------|------------------------|
| | | | 1,000 µg/mL in Methanol | 2,500 µg/mL in Acetone |
| 1 analyte | Toxaphene | 1 x 1 mL | EPA-1161-1 | PPS-240-1 |

Recommended Standards

| Method 525.2 | Part No. |
|----------------------------------|--|
| Calibration standards | SVM-525-1 PPM-525E-1 NPM-525C-1 NPM-525B-1 PPS-240-1 NPM-108B-1 |
| Internal and surrogate standards | ISM-510-1 ISM-511X |

EPA Method 526

Organic compounds

Method 526 is used to determine SOCs. It is a solid phase extraction method, using GC/MS with a capillary column.

Method 526 Calibration Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|--|--|-----------------------|
| 11 analytes, at 1,000 µg/mL, in methyl acetate | Acetochlor Cyanazine Diazinon 2,4-Dichlorophenol 1,2-Diphenylhydrazine Disulfoton | Fonofos Nitrobenzene Prometon Terbufos 2,4,6-Trichlorophenol | 1 x 1 mL SVM-526-1 |

Recommended Method 526 Internal Standard Solution

| Description | Analytes | Total Vol. | Part No. |
|--------------------------------------|--|------------|-----------|
| 3 analytes, at 500 µg/mL, in acetone | Acenaphthene-d ₁₀ Phenanthrene-d ₁₀ Chrysene-d ₁₂ | 1 x 1 mL | ISM-520-1 |

Recommended Method 526 Surrogate Standard

| Description | Analytes | Total Vol. | Part No. |
|-------------------------------------|---|------------|-----------|
| 2 analytes, at 500 µg/mL in acetone | 1,3-Dimethyl-2-nitrobenzene Triphenylphosphate | 1 x 1 mL | ISM-690-1 |

Primary Dilution Standard Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|--|--|------------------------|
| 11 analytes, at 1,000 µg/mL in ethyl acetate | Acetochlor Cyanazine Diazinon 2,4-Dichlorophenol 1,2-Diphenylhydrazine Disulfoton | Fonofos Nitrobenzene Prometon Terbufos 2,4,6-Trichlorophenol | 1 x 1 mL SVM-526A-1 |

Calibration Mixture

| Description | Analytes | Total Vol. | Part No. |
|---|---|--|-----------------------|
| 11 analytes, 1,000 µg/mL, in methylene chloride | Acetochlor Azobenzene Cyanazine Diazinon 2,4-Dichlorophenol Disulfoton | Fonofos Nitrobenzene Prometon Terbufos 2,4,6-Trichlorophenol | 1 x 1 mL SVM-527-1 |

Recommended Standards

| Method 526 | Part No. |
|----------------------|-----------|
| Calibration standard | SVM-526-1 |
| Surrogate standard | ISM-690-1 |
| Internal standard | ISM-520-1 |

EPA Method 527

Pesticides and flame retardants

Method 527 is used to determine selected pesticides and flame retardants. It is a solid phase extraction method, using GC/MS with a capillary column.

Recommended Method 527 Pesticides Mixture 1

| Description | Analytes | Total Vol. | Part No. |
|---|---|---|------------------------|
| 16 analytes, at 500 µg/mL, in ethyl acetate | Atrazine Bromacil Asana (esfenvalerate) Hexazinone Mirex Norflurazon Prometryn Thiobencarb (benthiocarb) | Bifenthrin S-Bioallethrin (esbiol) Fenvalerate Kepone Nitrofen Oxychlorthane Propazine Vinclozolin | 1 x 1 mL PPM-527A-1 |

Recommended Method 527 Pesticides Mixture 2

| Description | Analytes | Total Vol. | Part No. |
|---|---|-------------------------------|------------------------|
| 5 analytes, at 500 µg/mL in ethyl acetate | Chlorpyrifos Dimethoate Malathion | Parathion Terbufos sulfone | 1 x 1 mL PPM-527B-1 |

Recommended Method 527 Surrogate Standard Mixture

| Description | Analytes | Total Vol. | Part No. |
|--------------------------------------|--|------------|-----------|
| 3 analytes, at 500 µg/mL, in acetone | 1,3-Dimethyl-2-nitrobenzene Perylene-d ₁₂ Triphenyl phosphate (TPP) | 1 x 1 mL | ISM-710-1 |

Recommended Method 527 Internal Standard Solution

| Description | Analytes | Total Vol. | Part No. |
|--------------------------------------|--|------------|-----------|
| 3 analytes, at 500 µg/mL, in acetone | Acenaphthene-d ₁₀ Chrysene-d ₁₂ Phenanthrene-d ₁₀ | 1 x 1 mL | ISM-520-1 |

Tips and tools

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EPA Method 528

Phenols in drinking water

Method 528 is applicable for the measurement of phenols. This method uses solid phase extraction followed by capillary column GC/MS.

Method 528 Phenols Stock Calibration Standard

| Description | Analytes | Total Vol. | Part No. |
|---|--|--|-----------------------|
| 12 analytes, 2,000 µg/mL, in methylene chloride | 2,4,6-Trichlorophenol 2,4-Dichlorophenol 2,4-Dimethylphenol 2,4-Dinitrophenol 2-Chlorophenol 2-Methyl-4,6-dinitrophenol | 2-Nitrophenol 4-Chloro-3-methylphenol 4-Nitrophenol o-Cresol Pentachlorophenol Phenol | 1 x 1 mL PHM-500-1 |

Analyte Fortification Solution

| Description | Analytes and Concentration | Total Vol. | Part No. |
|------------------------------------|--|--|-----------------------|
| 12 analytes, in methylene chloride | 2,4,6-Trichlorophenol 2,4-Dichlorophenol 2,4-Dinitrophenol 2,4-Dimethylphenol 2-Chlorophenol 2-Methyl-4,6-dinitrophenol 2-Nitrophenol 4-Chloro-3-methylphenol 4-Nitrophenol o-Cresol Pentachlorophenol Phenol | 100 µg/mL 100 µg/mL 500 µg/mL 100 µg/mL 100 µg/mL 500 µg/mL 100 µg/mL 100 µg/mL 500 µg/mL 100 µg/mL 500 µg/mL 100 µg/mL | 1 x 1 mL PHM-501-1 |

Method 528 Internal Standard

| Description | Analytes and Concentration | Total Vol. | Part No. |
|-----------------------------------|---|----------------------------|-----------------------|
| 2 analytes, in methylene chloride | 2,3,4,5-Tetrachlorophenol 3-Nitro-o-xylene | 2,000 µg/mL 1,000 µg/mL | 1 x 1 mL PHM-502-1 |

EPA Method 529

Explosives and related compounds

Method 529 is used to determine explosives and related compounds. It is a solid phase extraction method, using GC/MS with a capillary column.

Recommended Method 529 Calibration Standard

| Description | Analytes | | | Total Vol. | Part No. |
|---|----------------------------|--------------------|-----------------------------|------------|-------------|
| 14 analytes, at 100 µg/mL, in ethyl acetate | 2-Amino-4,6-dinitrotoluene | 2,6-Dinitrotoluene | 4-Nitrotoluene | 1 x 1 mL | NAIM-529A-1 |
| | 4-Amino-2,6-dinitrotoluene | RDX | 1,3,5-Trinitrobenzene | | |
| | 3,5-Dinitroaniline | Nitrobenzene | Tetryl | | |
| | <i>m</i> -Dinitrobenzene | 2-Nitrotoluene | 2,4,6-Trinitrotoluene (TNT) | | |
| | 2,4-Dinitrotoluene | 3-Nitrotoluene | | | |

Internal Standard Fortification Mixture

| Description | Analytes | | | Total Vol. | Part No. |
|---|----------------------------|--------------------|-----------------------|------------|------------|
| 14 analytes, at 200 µg/mL, in ethyl acetate | 2-Nitrotoluene | 2,4-Dinitrotoluene | RDX | 1 x 1 mL | NAIM-530-1 |
| | 3,5-Dinitroaniline | 2,6-Dinitrotoluene | Tetryl | | |
| | 1,3-Dinitrobenzene | Nitrobenzene | TNT | | |
| | 2-Amino-4,6-dinitrotoluene | 3-Nitrotoluene | 1,3,5-Trinitrobenzene | | |
| | 4-Amino-2,6-dinitrotoluene | 4-Nitrotoluene | | | |

Calibration Mixture

| Description | Analytes and Concentration | | | | Total Vol. | Part No. |
|------------------------------|----------------------------|-----------|-----------------------------|-----------|------------|------------|
| 15 analytes, in acetonitrile | 2-Amino-4,6-dinitrotoluene | 100 µg/mL | 4-Nitroaniline | 200 µg/mL | 1 x 1 mL | NAIM-535-1 |
| | 1,3-Dinitrobenzene | 100 µg/mL | 4-Nitrotoluene | 200 µg/mL | | |
| | 2,4-Dinitrotoluene | 100 µg/mL | Nitrobenzene | 100 µg/mL | | |
| | 2,6-Dinitrotoluene | 100 µg/mL | RDX | 200 µg/mL | | |
| | 4-Amino-2,6-dinitrotoluene | 100 µg/mL | Tetryl | 200 µg/mL | | |
| | HMX | 200 µg/mL | 1,3,5-Trinitrobenzene | 100 µg/mL | | |
| | 2-Nitrotoluene | 200 µg/mL | 2,4,6-Trinitrotoluene (TNT) | 100 µg/mL | | |
| | 3-Nitrotoluene | 200 µg/mL | | | | |

Recommended Method 529 Internal and Surrogate Standards

| Description | Analytes | Concentration | Total Vol. | Part No. |
|-------------|--|---------------------------------|------------|------------|
| 4 analytes | 3,4-Dinitrotoluene | 1,000 µg/mL, in acetonitrile | 1 x 1 mL | IST-701A-1 |
| | 1,2,4-Trimethyl-5-nitrobenzene (2-pseudocumene) | 2,000 µg/mL, in methanol | | IST-706-1 |
| | 1,3,5-Trimethyl-2-nitrobenzene (2-nitromesitylene) | 1,000 µg/mL, in methanol | | IST-705A-1 |
| | Nitrobenzene-d ₅ | 1,000 µg/mL, in dichloromethane | | IST-210-1 |

Recommended Standards

| Method 529 | Part No. |
|----------------------|-------------------------------------|
| Calibration standard | NAIM-529A-1 |
| Surrogate standards | IST-705-1 IST-706-1 IST-210-1 |
| Internal standard | IST-704-1 |

EPA Method 531.1, 531.2

N-methylcarbamoyloximes and *N*-methylcarbamates

Methods 531.1 and 531.2 are used to measure *N*-methylcarbamoyloximes and *N*-methylcarbamates.

They use direct injections of the sample on HPLC, with postcolumn derivatization and a fluorescence detector.

Recommended Method 531.1 Carbamate Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|--|--|-----------------------|
| 10 analytes, at 100 µg/mL, in methanol | Aldicarb Aldicarb sulfone Aldicarb sulfoxide Carbaryl Carbofuran | 3-Hydroxycarbofuran Methiocarb Methomyl Oxamyl Propoxur (baygon) | 1 x 1 mL PPM-530-1 |

Recommended Method 531.2 Carbamate Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|--|--|--|------------------------|
| 11 analytes, at 100 µg/mL, in methanol | Aldicarb Aldicarb sulfone Aldicarb sulfoxide Carbaryl Carbofuran 1-Naphthol | 3-Hydroxycarbofuran Methiocarb Methomyl Oxamyl Propoxur (baygon) | 1 x 1 mL PPM-530C-1 |

SDWA Carbamate Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|---------------------------------------|----------------------|------------|------------|
| 2 analytes, at 100 µg/mL, in methanol | Carbofuran Oxamyl | 1 x 1 mL | PPM-530B-1 |

Carbamate Pesticides Mixture

| Description | Analytes | Total Vol. | Part No. |
|---------------------------------------|--|----------------------------------|-----------------------|
| 6 analytes, at 100 µg/mL, in methanol | Aldicarb sulfone Aldicarb sulfoxide Aldicarb | Carbofuran Methomyl Oxamyl | 1 x 1 mL PPM-251-1 |



PPM-530-1

Internal and Surrogate Standard Solutions (BDMC)

| Description | Solutions | Total Vol. | Part No. 100 µg/mL in Methanol | Part No. 100 µg/mL in Acetonitrile | Part No. 1,000 µg/mL in Methanol |
|-------------|--|------------|--------------------------------------|--|--|
| 2 solutions | 4-Bromo-3,5-dimethylphenyl <i>N</i> -Methylcarbamate (BDMC) | 1 x 1 mL | PPS-180-1 | PST-4015A100A01 | PST-4015M1000 |

EPA Method 532

Phenylurea compounds

Method 532 is used to determine phenylurea pesticides. It is a solid phase extraction method, using HPLC with a UV detector.

Pesticides Mixture Concentrate

| Description | Analytes | Total Vol. | Part No. |
|---|----------------------------------|---|-----------------------|
| 6 analytes, at 5,000 µg/mL, in methanol | Diuron Fluometuron Linuron | Propanil Siduron (mix of isomers) Tebuthiuron | 1 x 1 mL PPM-255-1 |

Recommended Method 532 Calibration Standard

| Description | Analytes | Total Vol. | Part No. |
|---|---|---|-----------------------|
| 8 analytes, at 200 µg/mL, in methanol/acetone | Diflubenzuron Diuron Fluometuron Linuron | Propanil Siduron Tebuthiuron Thidiazuron | 1 x 1 mL PPM-532-1 |

Recommended Method 532 Surrogate Standards

| Description | Analytes | Total Vol. | Part No. 500 µg/mL in Methanol/Acetonitrile | Part No. 200 µg/mL in Methanol/Acetonitrile | Part No. 500 µg/mL in Methanol | Part No. 5,000 µg/mL in Methanol |
|-------------|----------------------|------------|---|---|--------------------------------------|--|
| 2 analytes | Carbazole Monuron | 1 x 1 mL | PPM-532A-1 | PPM-536-1 | PPM-533-1 | PPM-534-1 |

Pesticides Mixture Concentrates

| Description | Analytes and Concentration | Total Vol. | Part No. in Methanol | Part No. 200 µg/mL in Acetonitrile/Acetone (9:1) |
|-------------|---|------------|-------------------------|--|
| 8 analytes | Diflubenzuron 100 µg/mL Diuron 100 µg/mL Fluometuron 100 µg/mL Linuron 100 µg/mL Propanil 100 µg/mL Siduron (mix of isomers) 200 µg/mL Tebuthiuron 100 µg/mL Thidiazuron 100 µg/mL | 1 x 1 mL | PPM-540-1 | PPM-541-1 |

EPA Method 535

Chloroacetanilide and other acetamide herbicide degradates

Method 535 is used to determine the ethanesulfonic acid (ESA) and oxanilic acid (OA) degradates of the chloroacetanilide and other acetamide herbicides. It uses solid phase extraction and GC/MS.

Recommended UCMR Acetanilide Pesticide Degradates Mixture

| Description | Analytes and Concentration | | | | Total Vol. | Part No. |
|-------------------------|----------------------------|----------|-----------------|----------|------------|-----------|
| 6 analytes, in methanol | Acetochlor ESA | 20 µg/mL | Alachlor OA | 40 µg/mL | 1 x 1 mL | PPM-535-1 |
| | Acetochlor OA | 40 µg/mL | Metolachlor ESA | 80 µg/mL | | |
| | Alachlor ESA | 20 µg/mL | Metolachlor OA | 10 µg/mL | | |
| | | | | | | |

Recommended Method 535 Surrogate and Internal Standards

| Description | Analytes | Total Vol. | Part No. 20 µg/mL | Part No. 100 µg/mL |
|--------------------------------------|------------------|------------|----------------------|-----------------------|
| Individual standards, in methanol | Dimethachlor ESA | 1 x 1 mL | PPS-440-1 | PPS-441-1 |
| | Butachlor ESA | 1 x 1 mL | PPS-450-1 | PPS-451-1 |

Metolachlor ESA Solution

| Description | Solution | Total Vol. | Part No. |
|---------------------------------------|-----------------------------|------------|-----------------|
| 1 solution, at 100 µg/mL, in methanol | Metolachlor ESA sodium salt | 1 x 1 mL | PST-1531M100A01 |

Metolachlor OA Solution

| Description | Solution | Total Vol. | Part No. |
|---------------------------------------|----------------|------------|-----------------|
| 1 solution, at 100 µg/mL, in methanol | Metolachlor OA | 1 x 1 mL | PST-1532M100A01 |

Acetochlor ESA Solution

| Description | Solution | Total Vol. | Part No. |
|---------------------------------------|----------------------------|------------|-----------------|
| 1 solution, at 100 µg/mL, in methanol | Acetochlor ESA sodium salt | 1 x 1 mL | PST-1532M100A01 |

Acetochlor OA Solution

| Description | Solution | Total Vol. | Part No. |
|---------------------------------------|---------------|------------|-----------------|
| 1 solution, at 100 µg/mL, in methanol | Acetochlor OA | 1 x 1 mL | PST-1882M100A01 |

Alachlor ESA Solution

| Description | Solution | Total Vol. | Part No. |
|---------------------------------------|--------------------------|------------|----------------|
| 1 solution, at 100 µg/mL, in methanol | Alachlor ESA sodium salt | 1 x 1 mL | PST-626M100A01 |

Alachlor OA Solution

| Description | Solution | Total Vol. | Part No. |
|------------------------------------|-------------|------------|----------------|
| 1 solution, 100 µg/mL, in methanol | Alachlor OA | 1 x 1 mL | PST-627M100A01 |

Recommended Standards

| Method 535 | Part No. |
|----------------------|------------------------|
| Calibration standard | PPM-535-1 |
| Internal standards | PPS-450-1 PPS-441-1 |
| Surrogate standards | PPS-440-1 PPS-441-1 |

EPA Method 536

Triazine pesticides

Method 536 is a liquid chromatography, electrospray ionization tandem mass spectrometry (LC/ESI-MS/MS) method used for the determination of triazine pesticides and their degradation products.

Method 536 Analyte Stock Standards

| Compound | Concentration | Volume | Part No. |
|-----------------------|------------------------|----------|--------------|
| Atrazine | 500 µg/mL, in methanol | 1 x 1 mL | PST-005M500 |
| Atrazine-desethyl | 500 µg/mL, in methanol | 1 x 1 mL | PST-4010M500 |
| Atrazine-desisopropyl | 500 µg/mL, in methanol | 1 x 1 mL | PST-4005M500 |
| Cyanazine | 500 µg/mL, in methanol | 1 x 1 mL | PST-1360M500 |
| Propazine | 500 µg/mL, in methanol | 1 x 1 mL | PST-850M500 |

| Compound | Concentration | Volume | Part No. |
|--------------------------------|------------------------|----------|-----------------|
| Atrazine-desethyl desisopropyl | 500 µg/mL, in methanol | 1 x 1 mL | PST-6935M500 |
| Simazine | 100 µg/mL, in methanol | 1 x 1 mL | PST-1130M100A01 |

Method 536 Internal Standards

| Compound | Concentration | Mass | Part No. |
|--|---------------|-----------|---------------|
| Atrazine-desethyl-d ₇ | Neat | 1 x 10 mg | PST-6910-10MG |
| Atrazine-desisopropyl-d ₅ (ethyl-d ₃) | Neat | 1 x 10 mg | PST-6915-10MG |
| Cyanazine-d ₅ (<i>n</i> -ethyl-d ₃) | Neat | 1 x 10 mg | PST-6920-10MG |
| Propazine-d ₁₄ | Neat | 1 x 10 mg | PST-6925-10MG |

| Compound | Concentration | Mass | Part No. |
|---|---------------|-----------|---------------|
| Simazine-d ₁₀ (diethyl-d ₁₀) | Neat | 1 x 10 mg | PST-6950-10MG |

Tips and tools

Find more EPA Method standards online at
www.agilent.com/chem/standards

EPA Method 539

Hormones in drinking water

Method 539 is for the determination of hormones. It uses solid phase extraction followed by liquid chromatography with electrospray ionization tandem mass spectrometry (LC/ESI-MS/MS).

Method 539 Mix 1

| Description | Analytes | Total Vol. | Part No. 100 µg/mL | Part No. 1,000 µg/mL |
|-------------------------|---|------------|-----------------------|-------------------------|
| 7 analytes, in methanol | 4-Androstene-3,17-dione β-Estradiol 17α-Ethynylestradiol Equilin Estriol Estrone Testosterone | 1 x 1 mL | HMM-100A-L | HMM-100A-H |

Method 539 Mix 2

| Description | Analytes and Concentration | Total Vol. | Part No. |
|-------------------------|---|--|------------------------|
| 7 analytes, in methanol | 4-Androstene-3,17-dione β-Estradiol 17α-Ethynylestradiol Equilin Estriol Estrone Testosterone | 30 µg/mL 40 µg/mL 90 µg/mL 100 µg/mL 80 µg/mL 100 µg/mL 10 µg/mL | 1 x 1 mL HMM-100B-1 |

Method 539 Surrogate Stock Standards

| Compound | Concentration | Mass | Part No. |
|---|---------------|-----------|---------------|
| 17α-Ethynylestradiol-2,4,16,16-d ₄ | Neat | 1 x 10 mg | DRG-1185-10MG |
| Bisphenol-A-d ₁₆ | Neat | 1 x 10 mg | RCC-240-10MG |

Method 539 Internal Standards

| Compound | Concentration | Mass | Part No. |
|---|---------------|-----------|---------------|
| 16α-Hydroxyestradiol-d ₂ | Neat | 1 x 10 mg | DRG-1190-10MG |
| Testosterone-d ₃ neat DRG-1195-10MG | Neat | 1 x 10 mg | DRG-1195-10MG |

EPA Method 547

Glyphosate

Method 547 is used to determine glyphosate. It uses direct injection of the sample on HPLC, with postcolumn derivatization and a fluorescence detector.

Recommended Method 547 Glyphosate Solution

| Description | Solutions | Total Vol. | Part No. |
|------------------------------------|------------|------------|-----------|
| 1 solution, at 100 µg/mL, in water | Glyphosate | 1 x 1 mL | PPS-190-1 |

EPA Method 548, 548.1

Endothall

Method 548 is used to determine endothall. It is a derivatization followed by liquid-solid extraction method, using GC with a capillary column and an electron capture detector. Method 548.1 is a GC/MS version of this method.

Recommended Method 548 Endothall Solution

| Description | Solution | Total Vol. | Part No. |
|-----------------------------------|-----------|------------|-----------|
| 1 solution, at 50 µg/mL, in water | Endothall | 1 x 1 mL | PPS-210-1 |

Recommended Method 548.1 Endothall Solutions

| Description | Solution | Total Vol. | Part No. 50 µg/mL in Methanol | Part No. 1,000 µg/mL in Acetone | Part No. 100 µg/mL in Methanol |
|-------------|-----------|------------|-------------------------------------|---------------------------------------|--------------------------------------|
| 1 solution | Endothall | 1 x 1 mL | PPS-211-1 | PST-1845K1000 | PST-1845M100A01 |

Recommended Method 548 Internal Standard Solutions

| Description | Solution | Total Vol. | Part No. 10 µg/mL in Methyl <i>tert</i> -butyl ether | Part No. 1,000 µg/mL in Toluene |
|-------------|--------------|------------|--|---------------------------------------|
| 1 solution | Endosulfan I | 1 x 1 mL | PPS-220-1 | PST-501T1000 |

Recommended Method 548.1 Internal Standard Solutions

| Description | Solution | Total Vol. | Part No. 500 µg/mL | Part No. 1,000 µg/mL |
|-------------------------|------------------------------|------------|-----------------------|-------------------------|
| 1 solution, in methanol | Acenaphthene-d ₁₀ | 1 x 1 mL | ATS-111-1 | ATS-112-1 |

Recommended Standards

| Method 548 | Part No. |
|----------------------|------------------------|
| Calibration standard | PPS-210-1 |
| Internal standards | PPS-220-1 ATS-112-1 |
| Method 548.1 | |
| Calibration standard | PPS-211-1 |
| Internal standard | ATS-111-1 |

EPA Method 549.2

Diquat and paraquat

Method 549.2 is used to determine diquat and paraquat. It is a liquid-solid extraction method, using HPLC and a UV detector.

Recommended Method 549.2 Diquat and Paraquat Mixture

| Description | Analytes | Total Vol. | Part No. |
|--------------------------------------|--|------------|-----------|
| 2 analytes, at 1,000 µg/mL, in water | Diquat (as dibromide) Paraquat (as dichloride) (Concentrations corrected to 1,000 µg/mL of each pesticide) | 1 x 1 mL | PPM-549-1 |

Recommended Standards

| Method 549.2 | Part No. |
|----------------------|-----------|
| Calibration standard | PPM-549-1 |

EPA Method 550, 550.1

Polycyclic aromatic hydrocarbons

Method 550 is used to determine polycyclic aromatic hydrocarbons. It is a liquid-liquid extraction method, using HPLC and coupled fluorescence and UV detectors. Method 550.1 uses liquid-solid extraction.

Recommended Method 550, 550.1 PAH Fortification Mixture

| Description | Analytes and Concentration | | | | Total Vol. | Part No. |
|------------------------------|-------------------------------|-------------|---------------------------------|-------------|------------|----------|
| 16 analytes, in acetonitrile | Acenaphthene | 1,000 µg/mL | Chrysene | 62.5 µg/mL | 1 x 1 mL | PM-551-1 |
| | Acenaphthylene | 1,000 µg/mL | Dibenz[<i>a,h</i>]anthracene | 12.5 µg/mL | | |
| | Anthracene | 62.5 µg/mL | Fluoranthene | 2.5 µg/mL | | |
| | Benz[<i>a</i>]anthracene | 1 µg/mL | Fluorene | 100 µg/mL | | |
| | Benzo[<i>b</i>]fluoranthene | 1 µg/mL | Indeno[1,2,3- <i>cd</i>]pyrene | 12.5 µg/mL | | |
| | Benzo[<i>k</i>]fluoranthene | 1.25 µg/mL | Naphthalene | 1,000 µg/mL | | |
| | Benzo[<i>ghi</i>]perylene | 5 µg/mL | Phenanthrene | 50 µg/mL | | |
| | Benzo[<i>a</i>]pyrene | 5 µg/mL | Pyrene | 62.5 µg/mL | | |

Recommended Method 550, 550.1 Internal Standard Solutions

| Description | Solution | Total Vol. | Part No. 100 µg/mL in Acetonitrile | Part No. 2,000 µg/mL in Acetone |
|-------------|----------------------|------------|--|---------------------------------------|
| 1 solution | 4,4-Difluorobiphenyl | 1 x 1 mL | PPS-270-1 | PPS-271-1 |

Recommended Standards

| EPA Method 550, 550.1 | Part No. |
|-----------------------|------------------------|
| Calibration standard | PM-551-1 |
| Internal standards | PPS-270-1 PPS-271-1 |

EPA Method 551.1

Chlorination disinfection by-products and chlorinated solvents, and halogenated pesticides and herbicides

Method 551.1 is used to determine chlorination disinfection by-products and chlorinated solvents. It is an extraction method, using GC with a capillary column and an electron capture detector.

Recommended Method 551.1 Disinfection By-products and Chlorinated Solvents Mixtures

| Description | Analytes | Total Vol. | Part No. | Part No. |
|-------------|--|--|---------------------------|---|
| | | | 2,000 µg/mL in Acetone | 100 µg/mL in Methyl <i>tert</i> -butyl ether |
| 19 analytes | Bromochloroacetonitrile Bromodichloromethane Bromoform Carbon tetrachloride Chloroform Chloropicrin Dibromoacetonitrile Dibromochloromethane 1,2-Dibromo-3-chloropropane (DBCP) 1,2-Dibromoethane (EDB) | Dichloroacetonitrile 1,1-Dichloro-2-propanone Trichloroacetonitrile Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene 1,2,3-Trichloropropane 1,1,1-Trichloro-2-propanone | 1 x 1 mL HCM-551D-1 | HCM-550-1 |

Recommended Method 551.1 Surrogate Standard Solution

| Description | Solution | Total Vol. | Part No. |
|--|--------------------|------------|-----------|
| 1 solution, 1,000 µg/mL, in acetone | Decafluorobiphenyl | 1 x 1 mL | IST-152-1 |

Recommended Standards

| Method 551.1 | Part No. |
|-----------------------|--|
| Calibration standards | HCM-551-1 PPM-551B-1 EPA-1244-1 PST-1535M100A01 |
| Internal standards | STS-113-1 STS-115-1 |
| Surrogate standard | IST-152-1 |

Technical note

Commercial amounts of MTBE extraction solvent often contain observable chlorinated solvent impurities, for example, chloroform, trichloroethene, and carbon tetrachloride. When present, these impurities can normally be removed by double distillation of the MTBE.

EPA Method 552, 552.1, 552.2, 552.3

Haloacetic acids and dalapon

Method 552, 552.1, 552.2 and 552.3 are used to determine halogenated acetic acids. These methods involve ion exchange liquid-solid extraction followed by GC processes, using a capillary column and electron capture detector.

Recommended Method 552 Haloacetic Acids Mixtures

| Description | Analytes | | Total Vol. | Mixture | Part No. |
|-------------|----------------------|------------------------|------------|--|------------|
| 8 analytes | Chloroacetic acid | Bromoacetic acid | 1 x 1 mL | Acids mixture in methyl <i>tert</i> -butyl ether, 1,000 µg/mL | PHM-552A |
| | Dichloroacetic acid | Bromochloroacetic acid | | | |
| | Trichloroacetic acid | Dibromoacetic acid | | Methylated mixture in methyl <i>tert</i> -butyl ether, 1,000 µg/mL | PHM-552M-1 |
| | 2,4-Dichlorophenol | 2,4,6-Trichlorophenol | | | |

Note: This mix is available in two forms: as free acids, or as methylated acids.

Recommended Methods 552.2, 552.3 Haloacetic Acids Mixtures, No Surrogate

| Description | Analytes and Concentration | | | | Total Vol. | Mixture | Part No. |
|-------------|----------------------------|-------------|--------------------------|-------------|---|--|-------------|
| 10 analytes | Chloroacetic acid | 600 µg/mL | Bromochloroacetic acid | 400 µg/mL | 1 x 1 mL | Acids mixture in methyl <i>tert</i> -butyl ether | PHM-5524M-1 |
| | Chlorodibromoacetic acid | 1,000 µg/mL | Bromodichloroacetic acid | 400 µg/mL | | | |
| | Dichloroacetic acid | 600 µg/mL | Dibromoacetic acid | 200 µg/mL | | | |
| | Trichloroacetic acid | 200 µg/mL | Tribromoacetic acid | 2,000 µg/mL | | | |
| | Bromoacetic acid | 400 µg/mL | Dalapon | 400 µg/mL | | | |
| | | | | | Methylated mixture in methyl <i>tert</i> -butyl ether | PHM-5524M-1 | |

Note: This mix is available in two forms: as free acids, or as methylated acids.

Recommended Internal and Surrogate Standards

| Standard | Total Vol. | Part No. | Part No. | Part No. |
|------------------------|------------|----------------------------|---|---|
| | | 1,000 µg/mL in Methanol | 1,000 µg/mL in Methyl <i>tert</i> -butyl ether | 2,000 µg/mL in Methyl <i>tert</i> -butyl ether |
| 1,2,3-Trichloropropane | 1 x 1 mL | PPS-250-1 | PPS-251-1 | RHH-039B2000 |

Recommended Standards

| Method 552 | Part No. | Method 552.1 | Part No. | Method 552.2 | Part No. | Method 552.3 | Part No. |
|----------------------|------------------------|----------------------|-------------|----------------------|------------------------|----------------------|-------------|
| Calibration standard | PHM-552A-1 | Calibration standard | PHM-5521A-1 | Calibration standard | PHM-5523A-1 | Calibration standard | PHM-5524A-1 |
| Internal standard | PPS-250-1 | Internal standard | PPS-251-1 | Internal standard | PHM-5524A-1 | Internal standard | PPS-251-1 |
| Surrogate standards | PPS-261-1 PPS-290-1 | Surrogate standard | PPS-300-1 | Surrogate standards | PPS-251-1 PPS-390-1 | Surrogate standard | PPS-430-1 |

EPA Method 553

Benzidines and nitrogen-containing pesticides

Method 553 is used for the measurement of benzidines and nitrogen-containing pesticides. It is an extraction method, using particle beam HPLC/MS.

Method 553 Analyte Mix

| Description | Analytes | Total Vol. | Part No. |
|--|--|--|-----------------------|
| 14 analytes, at 5,000 µg/mL, in acetonitrile/water (1:1 v/v) | Benzidine Benzoylprop ethyl Caffeine Carbaryl <i>o</i> -Chlorophenyl thiourea 3,3-Dichlorobenzidine 3,3-Dimethoxybenzidine | 3,3-Dimethylbenzidine Diuron Ethylene thiourea Linuron Monuron Rotenone Siduron (mix of isomers) | 1 x 1 mL NPM-530-1 |

Method 553 Analyte Mix

| Description | Analytes and Concentration | Total Vol. | Part No. |
|---|---|---|-----------------------|
| 13 analytes, in acetonitrile/methanol (1:1) | Benzidine Benzoylprop ethyl Caffeine Carbaryl <i>o</i> -Chlorophenyl thiourea 3,3-Dichlorobenzidine 3,3-Dimethoxybenzidine 3,3-Dimethylbenzidine Diuron Linuron Monuron Rotenone Siduron mix of isomers | 250 µg/mL 350 µg/mL 300 µg/mL 1,000 µg/mL 750 µg/mL 250 µg/mL 750 µg/mL 350 µg/mL 450 µg/mL 1,300 µg/mL 400 µg/mL 3,200 µg/mL 450 µg/mL | 1 x 1 mL NPM-531-1 |

Method 553 Surrogate Standards

| Compound | Concentration | Mass | Part No. |
|--|---------------|-----------|---------------|
| 3,3-Dichlorobenzidine-d ₆ | Neat | 1 x 10 mg | RCC-307-10MG |
| Benzidine-ring-d ₈ | Neat | 1 x 10 mg | RCC-235-10MG |
| Caffeine- ¹⁵ N ₂ | Neat | 1 x 10 mg | DRG-1180-10MG |
| DFTPPO | Neat | 1 x 10 mg | RAH-115-10MG |

Tips and tools

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EPA Method 554

Carbonyl compounds

Method 554 is used to determine carbonyl compounds. It is a derivatization followed by an HPLC method.

Recommended Method 554 Carbonyl Compounds Mixture

| Description | Analytes | | Total Vol. | Part No. |
|--|----------------|----------|------------|------------|
| 12 analytes, at 1,000 µg/mL, in acetonitrile | Acetaldehyde | Hexanal | 1 x 1 mL | ALD-554A-1 |
| | Butanal | Heptanal | | |
| | Cyclohexanone | Nonanal | | |
| | Crotonaldehyde | Octanal | | |
| | Decanal | Propanal | | |
| | Formaldehyde | Pentanal | | |

Recommended Standard

| Method 554 | Part No. |
|----------------------|-----------|
| Calibration standard | ALD-554-1 |

EPA Method 555

Chlorinated acids

Method 555 is used to determine chlorinated acids. It is an extraction followed by an HPLC method.

Recommended Method 555 Chlorinated Acids Mixture A

| Description | Analytes | | Total Vol. | Part No. |
|--|-------------|-------------------|------------|------------|
| 8 analytes, 1,000 µg/mL, in acetonitrile | Acifluorfen | Dicamba | 1 x 1 mL | HBM-555A-1 |
| | Bentazon | Dichlorprop | | |
| | Chloramben | Picloram | | |
| | 2,4-D | Silvex (2,4,5-TP) | | |

Recommended Method 555 Chlorinated Acids Mixture B

| Description | Analytes | | Total Vol. | Part No. |
|--|--------------------------|-------------------|------------|------------|
| 8 analytes, 1,000 µg/mL, in acetonitrile | 2,4-DB | MCPP | 1 x 1 mL | HBM-555B-1 |
| | 3,5-Dichlorobenzoic acid | 4-Nitrophenol | | |
| | Dinoseb | Pentachlorophenol | | |
| | MCPA | 2,4,5-T | | |

EPA Method 556, 556.1

Carbonyl compounds

Methods 556 and 556.1 are used to determine carbonyl compounds. They involve derivatization followed by GC/ECD methods.

Recommended Method 556 Aldehydes Mixture

| Description | Analytes | | | Total Vol. | Part No. |
|--|---------------|----------------|----------|------------|----------|
| 14 analytes, at 100 µg/mL, in acetonitrile/water | Acetaldehyde | Formaldehyde | Nonanal | 1 x 1 mL | ALD-556X |
| | Benzaldehyde | Glyoxal | Octanal | | |
| | Butanal | Hexanal | Pentanal | | |
| | Cyclohexanone | Heptanal | Propanal | | |
| | Decanal | Methyl glyoxal | | | |

Recommended Method 556 Surrogate Standards

| Description | Analyte | Total Vol. | Part No. 20 µg/mL | Part No. 10,000 µg/mL | Part No. 20,000 µg/mL |
|----------------------------|-----------------------------|------------|----------------------|--------------------------|--------------------------|
| 1 analyte, in acetonitrile | 2,4,5-Trifluoroacetophenone | 1 x 1 mL | PPS-411-1 | PPS-410-1 | PPS-412-1 |

Recommended Method 556 Internal Standard

| Description | Analyte | Total Vol | Part No. |
|------------------------------------|--------------------|-----------|-----------|
| 1 analyte, 10,000 µg/mL, in hexane | 1,2-Dibromopropane | 1 x 1 mL | PPS-400-1 |

Recommended Standards

| Method 556, 556.1 | Part No. |
|----------------------|-----------|
| Calibration standard | ALD-556X |
| Internal standard | PPS-400-1 |
| Surrogate standard | PPS-410-1 |

EPA Method 557

Haloacetic acids, bromate, and dalapon in drinking water

Method 557 is a direct inject, ion chromatography, (negative) electrospray ionization mass spectrometry (IC/ESI-MS/MS) method for the determination of haloacetic acids. Bromate and dalapon may also be measured concurrently with the haloacetic acids.

Method 557 Stock Standard Solution

| Description | Analytes | | Total Vol. | Part No. |
|---|--------------------------|------------------------------|------------|-----------|
| 10 analytes, at 1,000 µg/mL, in methyl <i>tert</i> -butyl ether | Bromoacetic acid | Dalapon | 1 x 1 mL | PHM-557-1 |
| | Bromochloroacetic acid | Dibromoacetic acid | | |
| | Bromodichloroacetic acid | Dichloroacetic acid | | |
| | Chloroacetic acid | Tribromoacetic acid | | |
| | Chlorodibromoacetic acid | Trichloroacetic acid (as Cl) | | |
| | | | | |

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