

Prep Standard - Chemical Standard Summary

Order ID : Q1488

Test : TCLP Herbicide

Prepbatch ID : PB167090,

Sequence ID/Qc Batch ID: ps031225,

Standard ID :

EP2552,EP2553,EP2576,PP24061,PP24062,PP24064,PP24065,PP24066,PP24067,PP24068,PP24069,PP24070,PP2
4193,PP24196,

Chemical ID :

E3370,E3551,E3554,E3657,E3826,E3873,E3881,M5173,P10549,P11180,P11181,P12619,P12629,P12686,P12708,P12
709,P13510,P13511,P13512,P13513,P13526,P13527,P13528,W3112,

Extractions STANDARD PREPARATION LOG

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|--------------------|------------------------|------------------|------------------------|--------------------|----------------|------------------|-----------------------------------|
| 3883 | 12N H2SO4 solution | EP2552 | 10/21/2024 | 04/21/2025 | Rajesh Parikh | None | None | RUPESHKUMAR SHAH 10/21/2024 |

FROM 333.00000ml of M5173 + 667.00000ml of W3112 = Final Quantity: 1000.000 ml

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|-------------|------------------------|------------------|------------------------|--------------------|-------------------------------------|------------------|-----------------------------------|
| 3884 | 6 N NAOH | EP2553 | 10/21/2024 | 04/21/2025 | Rajesh Parikh | Extraction_SC ALE_2 (EX-SC-2) | None | RUPESHKUMAR SHAH 10/21/2024 |

FROM 1000.00000ml of W3112 + 240.00000gram of E3657 = Final Quantity: 1000.000 ml



| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|---|------------------------|------------------|------------------------|--------------------|-------------------------------------|------------------|-----------------------------------|
| 601 | Acidified Sodium Sulphate 2 | EP2576 | 01/06/2025 | 06/02/2025 | Rajesh Parikh | Extraction_SC ALE_2 (EX-SC-2) | None | RUPESHKUMAR SHAH 01/06/2025 |
| <u>FROM</u> | 100.00000ml of E3370 + 150.00000ml of M5173 + 3000.00000ml of E3551 = Final Quantity: 3000.000 gram | | | | | | | |

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|--|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1321 | 2/200 PPM Herb Mega Mix | PP24061 | 11/26/2024 | 05/09/2025 | Ankita Jodhani | None | None | Yogesh Patel |
| <u>FROM</u> | 0.20000ml of P10549 + 1.00000ml of P11180 + 1.00000ml of P12619 + 1.00000ml of P12629 + 1.00000ml of P12686 + 95.80000ml of E3826 = Final Quantity: 100.000 ml | | | | | | | |



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Pest/Pcb STANDARD PREPARATION LOG

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|-----------------------|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1453 | 1000 PPB Herb MIX STD | PP24065 | 11/26/2024 | 05/09/2025 | Ankita Jodhani | None | None | Yogesh Patel |
| | | | | | | | | 11/27/2024 |

FROM 0.50000ml of E3826 + 0.50000ml of PP24061 = Final Quantity: 1.000 ml

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|----------------------|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1454 | 750 PPB Herb MIX STD | PP24066 | 11/26/2024 | 05/09/2025 | Ankita Jodhani | None | None | Yogesh Patel |
| | | | | | | | | 11/27/2024 |

FROM 0.25000ml of E3826 + 0.75000ml of PP24065 = Final Quantity: 1.000 ml

Pest/Pcb STANDARD PREPARATION LOG

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|----------------------|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1455 | 500 PPB Herb MIX STD | PP24067 | 11/26/2024 | 05/09/2025 | Ankita Jodhani | None | None | Yogesh Patel |
| | | | | | | | | 11/27/2024 |

FROM 0.75000ml of E3826 + 0.25000ml of PP24061 = Final Quantity: 1.000 ml

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|----------------------|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1456 | 200 PPB Herb MIX STD | PP24068 | 11/26/2024 | 05/09/2025 | Ankita Jodhani | None | None | Yogesh Patel |
| | | | | | | | | 11/27/2024 |

FROM 0.90000ml of E3826 + 0.10000ml of PP24061 = Final Quantity: 1.000 ml

Pest/Pcb STANDARD PREPARATION LOG

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|---------------------------|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1854 | 1000 PPB HERB MIX ICV STD | PP24069 | 11/26/2024 | 05/09/2025 | Ankita Jodhani | None | None | Yogesh Patel |
| | | | | | | | | 11/27/2024 |

FROM 0.50000ml of E3826 + 0.50000ml of PP24062 = Final Quantity: 1.000 ml

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|----------------------|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1691 | 750 PPB ICV HERB STD | PP24070 | 11/26/2024 | 05/09/2025 | Ankita Jodhani | None | None | Yogesh Patel |
| | | | | | | | | 11/27/2024 |

FROM 0.25000ml of E3826 + 0.75000ml of PP24069 = Final Quantity: 1.000 ml

Pest/Pcb STANDARD PREPARATION LOG

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|---|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 1848 | 5000/500000 PPB Herbicide Spike (Free Acid) | PP24193 | 02/12/2025 | 07/29/2025 | Abdul Mirza | None | None | Ankita Jodhani |
| | | | | | | | | 02/13/2025 |

FROM 0.50000ml of P13528 + 1.00000ml of P13526 + 1.00000ml of P13527 + 47.50000ml of E3873 = Final Quantity: 50.000 ml

| <u>Recipe ID</u> | <u>NAME</u> | <u>NO.</u> | <u>Prep Date</u> | <u>Expiration Date</u> | <u>Prepared By</u> | <u>ScaleID</u> | <u>PipetteID</u> | <u>Supervised By</u> |
|------------------|---|-------------------------|------------------|------------------------|--------------------|----------------|------------------|----------------------|
| 60 | 5000 PPB Herbicide Surg Spike (Free Acid) | PP24196 | 02/18/2025 | 07/29/2025 | Abdul Mirza | None | None | Ankita Jodhani |
| | | | | | | | | 02/21/2025 |

FROM 1.25000ml of P13510 + 1.25000ml of P13511 + 1.25000ml of P13512 + 1.25000ml of P13513 + 195.00000ml of E3873 = Final Quantity: 200.000 ml

CHEMICAL RECEIPT LOG BOOK

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|------------------|---|------------|-----------------|-------------------------|-----------------------------|----------------|
| Seidler Chemical | BA-9244-03 / Ether, Anhydrous, Purified (cs/4x4L) | 0000288039 | 07/17/2025 | 08/01/2022 / Rajesh | 07/13/2022 / Rajesh | E3370 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|-----------------------------|--|--------|-----------------|-------------------------|-----------------------------|----------------|
| PCI Scientific Supply, Inc. | PC19631-100 / SODIUM SULFATE, ANHYDROUS, PEST GRADE, 1 | 313201 | 07/01/2025 | 01/03/2024 / Rajesh | 07/20/2023 / Rajesh | E3551 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|------------------|---|-------|-----------------|-------------------------|-----------------------------|----------------|
| Seidler Chemical | BA-9335-02 / Iso-Octane (2,2,4-Trimethypentane) Ultra Resi-Analyzed Grade | 63160 | 11/05/2025 | 08/09/2023 / Rajesh | 08/09/2023 / Rajesh | E3554 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|-----------------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| PCI Scientific Supply, Inc. | PC19510-5 / Sodium Hydroxide Pellets 2.5 Kg, Pk of 4 | 23B1556310 | 12/31/2025 | 12/04/2023 / Rajesh | 12/01/2023 / Rajesh | E3657 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|------------------|---|------------|-----------------|-------------------------|-----------------------------|----------------|
| Seidler Chemical | BA-9262-03 / Hexane, Ultra-Resi (cs/4x4L) | 24G1962003 | 05/09/2025 | 11/09/2024 / Rajesh | 11/07/2024 / Rajesh | E3826 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| Seidler Chemical | BA-9254-03 / Acetone, Ultra Resi (cs/4x4L) | 24H2762008 | 07/29/2025 | 01/29/2025 / Rajesh | 01/29/2025 / Rajesh | E3873 |

CHEMICAL RECEIPT LOG BOOK

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|-----------------------------|--|--------|-----------------|-------------------------|-----------------------------|----------------|
| PCI Scientific Supply, Inc. | PC04977-3 / Ether, Anhydrous, Glass Distilled, HRGC/HPLC, 4L | 242789 | 08/14/2025 | 02/14/2025 / Rajesh | 01/06/2025 / Rajesh | E3881 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|------------------|---|------------|-----------------|-------------------------|-----------------------------|----------------|
| Seidler Chemical | BA-9673-33 / Sulfuric Acid, Instra-Analyzed (cs/6c2.5L) | 0000281827 | 06/02/2025 | 06/01/2022 / | 04/05/2022 / william | M5173 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|--|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32254 / Dalapon Methyl Ester, 1000 ug/ml | A0170243 | 05/26/2025 | 11/26/2024 / Ankita | 04/06/2021 / dhaval | P10549 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|--|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32050 / Herbicide, 8000 series, 515 Surrogate [ester] 2,4-dichlorophenyl acetic acid methyl ester, 1mL, 200ug/mL, Hexane | A0172864 | 05/26/2025 | 11/26/2024 / Ankita | 11/01/2021 / Abdul | P11180 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|--|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32050 / Herbicide, 8000 series, 515 Surrogate [ester] 2,4-dichlorophenyl acetic acid methyl ester, 1mL, 200ug/mL, Hexane | A0172864 | 05/26/2025 | 11/26/2024 / Ankita | 11/01/2021 / Abdul | P11181 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|---|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32062 / Herbicide Mix, 500/8000, Standard #4 [methyl ester] 200ug/mL, hexane, 1mL/ampul | A0155055 | 05/26/2025 | 11/26/2024 / Ankita | 07/03/2023 / Abdul | P12619 |

CHEMICAL RECEIPT LOG BOOK

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|---|---------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32055 / Herbicide Mix, 500/8000, Standard #1 [methyl ester] 200ug/mL, hexane, 1mL/ampul | A192429 | 05/26/2025 | 11/26/2024 / Ankita | 07/03/2023 / Abdul | P12629 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|---|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32059 / Herbicide Mix#3 (Methyl Ester), 20000 ug/ml | A0199844 | 05/26/2025 | 11/26/2024 / Ankita | 07/24/2023 / Abdul | P12686 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|---|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151M / Chlorinated Herbicide Mixtures, Methyl Esters | 0006752480 | 05/26/2025 | 11/26/2024 / Ankita | 08/09/2023 / Abdul | P12708 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|---|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151M / Chlorinated Herbicide Mixtures, Methyl Esters | 0006752480 | 05/26/2025 | 11/26/2024 / Ankita | 08/09/2023 / Abdul | P12708 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|---|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151M / Chlorinated Herbicide Mixtures, Methyl Esters | 0006752480 | 05/26/2025 | 11/26/2024 / Ankita | 08/09/2023 / Abdul | P12709 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|---|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151M / Chlorinated Herbicide Mixtures, Methyl Esters | 0006752480 | 05/26/2025 | 11/26/2024 / Ankita | 08/09/2023 / Abdul | P12709 |

CHEMICAL RECEIPT LOG BOOK

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|--|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32049 / Herbicide, 8000 series, 515 Surrogate [free acid] 2,4-dichlorophenyl acetic acid, 1mL, 200ug/mL, | A0212676 | 08/18/2025 | 02/18/2025 / Abdul | 08/16/2024 / yogesh | P13510 |

MeOH

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|--|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32049 / Herbicide, 8000 series, 515 Surrogate [free acid] 2,4-dichlorophenyl acetic acid, 1mL, 200ug/mL, | A0212676 | 08/18/2025 | 02/18/2025 / Abdul | 08/16/2024 / yogesh | P13511 |

MeOH

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|--|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32049 / Herbicide, 8000 series, 515 Surrogate [free acid] 2,4-dichlorophenyl acetic acid, 1mL, 200ug/mL, | A0212676 | 08/18/2025 | 02/18/2025 / Abdul | 08/16/2024 / yogesh | P13512 |

MeOH

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------|--|----------|-----------------|-------------------------|-----------------------------|----------------|
| Restek | 32049 / Herbicide, 8000 series, 515 Surrogate [free acid] 2,4-dichlorophenyl acetic acid, 1mL, 200ug/mL, | A0212676 | 08/18/2025 | 02/18/2025 / Abdul | 08/16/2024 / yogesh | P13513 |

MeOH

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151A / Chlorinated Herbicide Mixtures, Free Acids | 0006810955 | 08/12/2025 | 02/12/2025 / Abdul | 09/03/2024 / Abdul | P13526 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151A / Chlorinated Herbicide Mixtures, Free Acids | 0006810955 | 08/12/2025 | 02/12/2025 / Abdul | 09/03/2024 / Abdul | P13526 |

CHEMICAL RECEIPT LOG BOOK

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151A / Chlorinated Herbicide Mixtures, Free Acids | 0006810955 | 08/12/2025 | 02/12/2025 / Abdul | 09/03/2024 / Abdul | P13527 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151A / Chlorinated Herbicide Mixtures, Free Acids | 0006810955 | 08/12/2025 | 02/12/2025 / Abdul | 09/03/2024 / Abdul | P13527 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151A / Chlorinated Herbicide Mixtures, Free Acids | 0006810955 | 08/12/2025 | 02/12/2025 / Abdul | 09/03/2024 / Abdul | P13528 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|----------------------|--|------------|-----------------|-------------------------|-----------------------------|----------------|
| Agilent Technologies | HBM-8151A / Chlorinated Herbicide Mixtures, Free Acids | 0006810955 | 08/12/2025 | 02/12/2025 / Abdul | 09/03/2024 / Abdul | P13528 |

| Supplier | ItemCode / ItemName | Lot # | Expiration Date | Date Opened / Opened By | Received Date / Received By | Chemtech Lot # |
|------------------|---------------------|---------------------|-----------------|-------------------------|-----------------------------|----------------|
| Seidler Chemical | DIW / DI Water | Daily Lab-Certified | 07/03/2029 | 07/03/2024 / Iwona | 07/03/2024 / Iwona | W3112 |

Ether, Anhydrous
BAKER ANALYZED® A.C.S. Reagent
Contains BHT as a Preservative
Suitable for Fat Extraction



Material No.: 9244-03
Batch No.: 0000288039
Manufactured Date: 2021/07/22
Expiration Date: 2023/07/22
Revision No: 1

Certificate of Analysis

Meets ACS Reagent Chemical Requirements,

| Test | Specification | Result |
|--|---------------|----------|
| Assay ((C ₂ H ₅) ₂ O) (by GC, corrected for water) | >= 99.0 % | 100.0 |
| Alcohol (C ₂ H ₅ OH) | Passes Test | PT |
| Carbonyl Compounds (as HCHO) (by polarography) | <= 0.001 % | < 0.001 |
| Color (APHA) | <= 10 | < 5 |
| Peroxide (as H ₂ O ₂) | <= 1 ppm | < 1 |
| Preservative (BHT) | >= 7 ppm | 9 |
| Residue after Evaporation | <= 0.0010 % | < 0.0010 |
| Titration Acid (μeq/g) | <= 0.2 | < 0.2 |
| Water (by KF, coulometric) | <= 0.01 % | 0.01 |

For Laboratory, Research or Manufacturing Use
Meets Reagent Specifications for testing USP/NF monographs

Country of Origin: US

Recd. by RP on 7/13/22

E 3370


Jamie Ethier
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700



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QUÍMICOS
MONTERREY, S.A. DE C.V.**

MIRADOR 201, COL. MIRADOR
MONTERREY, N.L. MEXICO
CP 64070
TEL +52 81 13 52 57 57
www.pqm.com.mx

CERTIFICATE OF ANALYSIS

| | | | |
|------------------------|-----------------------------------|---------------|---------------------------------|
| PRODUCT : | SODIUM SULFATE CRYSTALS ANHYDROUS | | |
| QUALITY : | ACS (CODE RMB3375) | FORMULA : | Na ₂ SO ₄ |
| SPECIFICATION NUMBER : | 6399 | RELEASE DATE: | ABR/21/2023 |
| LOT NUMBER : | 313201 | | |

| TEST | SPECIFICATIONS | LOT VALUES |
|--|----------------|-------------|
| Assay (Na ₂ SO ₄) | Min. 99.0% | 99.7 % |
| pH of a 5% solution at 25°C | 5.2 - 9.2 | 6.1 |
| Insoluble matter | Max. 0.01% | 0.005 % |
| Loss on ignition | Max. 0.5% | 0.1 % |
| Chloride (Cl) | Max. 0.001% | <0.001 % |
| Nitrogen compounds (as N) | Max. 5 ppm | <5 ppm |
| Phosphate (PO ₄) | Max. 0.001% | <0.001 % |
| Heavy metals (as Pb) | Max. 5 ppm | <5 ppm |
| Iron (Fe) | Max. 0.001% | <0.001 % |
| Calcium (Ca) | Max. 0.01% | 0.002 % |
| Magnesium (Mg) | Max. 0.005% | 0.001 % |
| Potassium (K) | Max. 0.008% | 0.003 % |
| Extraction-concentration suitability | Passes test | Passes test |
| Appearance | Passes test | Passes test |
| Identification | Passes test | Passes test |
| Solubility and foreign matter | Passes test | Passes test |
| Retained on US Standard No. 10 sieve | Max. 1% | 0.1 % |
| Retained on US Standard No. 60 sieve | Min. 94% | 97.3 % |
| Through US Standard No. 60 sieve | Max. 5% | 2.5 % |
| Through US Standard No. 100 sieve | Max. 10% | 0.1 % |

COMMENTS

QC: PhC Irma Belmares

If you need further details, please call our factory or contact our local distributor.

Recd. by R3 on 7/24/23 E 3551

RC-02-01, Ed. 3

Certificate of Analysis



Date of Release: 6/9/2023
Name: 2,2,4-Trimethylpentane [Isooctane]
OmniSolv®
Item No: TX1389 all size codes
Lot / Batch No: 63160
Country of Origin: Germany

| Characteristic | Requirement | | Results | Units |
|---|-------------|-------|--------------|-------|
| | Min. | Max. | | |
| Assay (GC) | 99.5 | | > 99.99 | % |
| Capillary ECD responsive substances (as PCNB) | | 5 | 0.24 | ng/L |
| Color (APHA) | | 10 | < 10 | |
| Evaporation residue | | 1 | < 0.5 | ppm |
| Filtered through 0.2 µm filter | | | Passes test | |
| Fluorescence (as quinine base) | | 250 | 71 | ppt |
| Form | | | Clear liquid | |
| Infrared Spectrum | | | Conforms | |
| Refractive index (at 20°C) | | | 1.3915 | |
| UV Abs. at 200 nm | | 1.00 | 0.137 | AU |
| UV Abs. at 220 nm | | 0.05 | 0.024 | AU |
| UV Abs. at 230 nm | | 0.02 | 0.003 | AU |
| UV Abs. at 250 nm | | 0.005 | 0.003 | AU |
| UV Abs. at 270 nm | | 0.005 | 0.002 | AU |
| UV Abs. at 300 nm | | 0.005 | 0.004 | AU |
| UV Cut-off | | 200 | 191.1 | nm |
| Water (H ₂ O) | | 0.01 | 0.001 | % |

Michael Hutchinson,

Quality Control Manager

This document has been produced electronically and is valid without a signature.

EMD Millipore is a division of Merck KGaA, Darmstadt, Germany
EMD Millipore Corporation
400 Summit Drive,
Burlington, MA 01803
U.S.A.

Recd by RP on 8/9/23

E3554



Certificate of Analysis

Sodium Hydroxide (Pellets)

Material: 0583
Grade: ACS GRADE
Batch Number: 23B1556310

Chemical Formula: NaOH
Molecular Weight: 40
CAS #: 1310-73-2
Appearance:

Manufacture Date: 12/14/2022
Expiration Date: 12/31/2025

Storage: Room Temperature

Pellets

| TEST | SPECIFICATION | ANALYSIS | DISPOSITION |
|--------------------|------------------------|---------------------|-------------|
| Calcium | $\leq 0.005 \%$ | $< 0.005 \%$ | PASS |
| Chloride | $\leq 0.005 \%$ | 0.002 % | PASS |
| Heavy Metals | $\leq 0.002 \%$ | $< 0.002 \%$ | PASS |
| Iron | $\leq 0.001 \%$ | $< 0.001 \%$ | PASS |
| Magnesium | $\leq 0.002 \%$ | $< 0.002 \%$ | PASS |
| Mercury | $\leq 0.1 \text{ ppm}$ | $< 0.1 \text{ ppm}$ | PASS |
| Nickel | $\leq 0.001 \%$ | $< 0.001 \%$ | PASS |
| Nitrogen Compounds | $\leq 0.001 \%$ | $< 0.001 \%$ | PASS |
| Phosphate | $\leq 0.001 \%$ | $< 0.001 \%$ | PASS |
| Potassium | $\leq 0.02 \%$ | $< 0.02 \%$ | PASS |
| Purity | $\geq 97.0 \%$ | 99.2 % | PASS |
| Sodium Carbonate | $\leq 1.0 \%$ | 0.5 % | PASS |
| Sulfate | $\leq 0.003 \%$ | $< 0.003 \%$ | PASS |

Internal ID #: 710

Signature

We certify that this batch conforms to the specifications listed.

This document has been electronically produced and is valid without a signature.

Leona Edwardson, Quality Control Sr. Manager - Solon
VWR Chemicals, LLC.
28600 Fountain Parkway, Solon OH 44139 USA

Additional Information

Analysis may have been rounded to significant digits in specification limits.

Product meets analytical specifications of the grades listed.



n-Hexane 95%
ULTRA RESI-ANALYZED
For Organic Residue Analysis



Material No.: 9262-03
Batch No.: 24G1962003
Manufactured Date: 2024-05-23
Expiration Date: 2025-08-22
Revision No.: 0

Certificate of Analysis

| Test | Specification | Result |
|---|----------------|-------------|
| FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL) | ≤ 5 | 3 |
| ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL) | ≤ 10 | 1 |
| ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL) | ≤ 5 | 1 |
| Assay (Total Saturated C ₆ Isomers) (by GC, corrected for water) | $\geq 99.5 \%$ | 99.7 % |
| Assay (as n-Hexane) (by GC, corrected for water) | $\geq 95 \%$ | 98 % |
| Color (APHA) | ≤ 10 | 5 |
| Residue after Evaporation | ≤ 1.0 ppm | 0.1 ppm |
| Substances Darkened by H ₂ SO ₄ | Passes Test | Passes Test |
| Water (by KF, coulometric) | $\leq 0.05 \%$ | < 0.01 % |

For Laboratory, Research, or Manufacturing Use
MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC

E 3826

Rec'd by RP on 11/7/24

Jamie Croak
Director Quality Operations, Bioscience Production

Acetone

BAKER RESI-ANALYZED® Reagent

For Organic Residue Analysis

avantor™



Material No.: 9254-03

Batch No.: 24H2762008

Manufactured Date: 2024-04-18

Expiration Date: 2027-04-18

Revision No.: 0

Certificate of Analysis

| Test | Specification | Result |
|---|---------------|-------------|
| Assay ((CH ₃) ₂ CO) (by GC, corrected for water) | >= 99.4 % | 100.0 % |
| Color (APHA) | <= 10 | 5 |
| Residue after Evaporation | <= 1.0 ppm | 0.0 ppm |
| Substances Reducing Permanganate | Passes Test | Passes Test |
| Titration Acid (μeq/g) | <= 0.3 | 0.2 |
| Titration Base (μeq/g) | <= 0.6 | <0.1 |
| Water (H ₂ O) | <= 0.5 % | <0.1 % |
| FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL) | <= 5 | 1 |
| ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL) | <= 10 | 1 |

For Laboratory, Research, or Manufacturing Use

MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

Country of Origin: United States

Packaging Site: Phillipsburg Mfg Ctr & DC

Recd. by RP on 1/29/25

E 3873

Jamie Croak
Director Quality Operations, Bioscience Production

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials LLC

Certificate of Analysis

1 Reagent Lane
 Fair Lawn, NJ 07410
 201.796.7100 tel
 201.796.1329 fax

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System
 Standard ISO9001:2015 by SAI Global Certificate Number CERT - 0120633

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Thermo Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Products are for research use or further manufacturing. Not for direct administration to humans or animals. It is the responsibility of the final formulator and end user to determine suitability based upon the intended use of the end product. Products are tested to meet the analytical requirements of the noted grade. The following information is the actual analytical results obtained.

| | | | |
|-------------------|--|-----------------------------|------------|
| Catalog Number | E199 | Quality Test / Release Date | 08/02/2024 |
| Lot Number | 242789 | Expiration Date | Jun/2025 |
| Description | ETHYL ETHER, PESTICIDE GRADE | | |
| Country of Origin | Mexico | | |
| Chemical Origin | Organic - synthetic | | |
| BSE/TSE Comment | This product was derived from synthetic raw materials and the manufacturing process excluded contamination with any animal products. | | |

| N/A | | | |
|------------------------|------------------|-----------------------------|--|
| Result Name | Units | Specifications | Test Value |
| APPEARANCE | | REPORT | Clear, colorless liquid free of suspended matter |
| ASSAY | % | >= 99.5 | 99.97 |
| COLOR | APHA | <= 10 | 5 |
| EVAPORATION RESIDUE | ppm | <= 3 | 0.2 |
| GC-ECD ANALYSIS | pg/ml | <= 10 | <1 |
| OPTICAL ABS AT 218 NM | ABSORBANCE UNITS | <= 1.00 | 0.19 |
| OPTICAL ABS AT 250 NM | ABSORBANCE UNITS | <= 0.08 | 0.05 |
| OPTICAL ABS AT 270 NM | ABSORBANCE UNITS | <= 0.02 | 0.01 |
| OPTICAL ABS AT 300 NM | ABSORBANCE UNITS | <= 0.01 | 0.002 |
| OPTICAL ABS AT 350 NM | ABSORBANCE UNITS | <= 0.01 | <0.001 |
| PEROXIDE | ppm | <= 5 | <1 |
| PRESERVATIVE - ETHANOL | % | Inclusive Between 1.5 - 2.5 | 1.8 |
| WATER (H2O) | % | <= 0.08 | 0.003 |

Kalyan Paruchuri

Kalyan Paruchuri - Quality Control Supervisor - Bridgewater

E 3881

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of this catalog number listed above.
 If there are any questions with this certificate, please call at (800) 227-6701.

*Based on suggested storage condition.

Hydrochloric Acid, 36.5–38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis



Material No.: 9530-33
Batch No.: 0000281827
Manufactured Date: 2021/03/30
Retest Date: 2026/03/29
Revision No: 1

Certificate of Analysis

| Test | Specification | Result |
|---|---------------|---------|
| ACS – Assay (as HCl) (by acid–base titrn) | 36.5 – 38.0 % | 37.6 |
| ACS – Color (APHA) | <= 10 | 5 |
| ACS – Residue after Ignition | <= 3 ppm | 1 |
| ACS – Specific Gravity at 60°/60°F | 1.185 – 1.192 | 1.189 |
| ACS – Bromide (Br) | <= 0.005 % | < 0.005 |
| ACS – Extractable Organic Substances | <= 5 ppm | < 1 |
| ACS – Free Chlorine (as Cl ₂) | <= 0.5 ppm | < 0.5 |
| Phosphate (PO ₄) | <= 0.05 ppm | < 0.03 |
| Sulfate (SO ₄) | <= 0.5 ppm | < 0.3 |
| Sulfite (SO ₃) | <= 0.8 ppm | 0.3 |
| Ammonium (NH ₄) | <= 3 ppm | < 1 |
| Trace Impurities – Arsenic (As) | <= 0.010 ppm | < 0.003 |
| Trace Impurities – Aluminum (Al) | <= 10.0 ppb | 0.5 |
| Arsenic and Antimony (as As) | <= 5 ppb | < 3 |
| Trace Impurities – Barium (Ba) | <= 1.0 ppb | < 0.2 |
| Trace Impurities – Beryllium (Be) | <= 1.0 ppb | < 0.2 |
| Trace Impurities – Bismuth (Bi) | <= 10.0 ppb | < 1.0 |
| Trace Impurities – Boron (B) | <= 20.0 ppb | < 5.0 |
| Trace Impurities – Cadmium (Cd) | <= 1.0 ppb | < 0.3 |
| Trace Impurities – Calcium (Ca) | <= 50.0 ppb | 15.0 |
| Trace Impurities – Chromium (Cr) | <= 1.0 ppb | < 0.4 |
| Trace Impurities – Cobalt (Co) | <= 1.0 ppb | < 0.3 |
| Trace Impurities – Copper (Cu) | <= 1.0 ppb | < 0.1 |
| Trace Impurities – Gallium (Ga) | <= 1.0 ppb | < 0.2 |

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700
Avantor Performance Materials, LLC
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

| Test | Specification | Result |
|--|---------------|--------|
| Trace Impurities – Germanium (Ge) | <= 3.0 ppb | < 2.0 |
| Trace Impurities – Gold (Au) | <= 4.0 ppb | 3.0 |
| Heavy Metals (as Pb) | <= 100 ppb | < 50 |
| Trace Impurities – Iron (Fe) | <= 15.0 ppb | 1.0 |
| Trace Impurities – Lead (Pb) | <= 1.0 ppb | < 0.5 |
| Trace Impurities – Lithium (Li) | <= 1.0 ppb | < 0.2 |
| Trace Impurities – Magnesium (Mg) | <= 10.0 ppb | < 0.4 |
| Trace Impurities – Manganese (Mn) | <= 1.0 ppb | < 0.4 |
| Trace Impurities – Mercury (Hg) | <= 0.5 ppb | 0.2 |
| Trace Impurities – Molybdenum (Mo) | <= 10.0 ppb | < 5.0 |
| Trace Impurities – Nickel (Ni) | <= 4.0 ppb | < 0.3 |
| Trace Impurities – Niobium (Nb) | <= 1.0 ppb | < 0.2 |
| Trace Impurities – Potassium (K) | <= 9.0 ppb | < 2.0 |
| Trace Impurities – Selenium (Se), For Information Only | ppb | 1.0 |
| Trace Impurities – Silicon (Si) | <= 100.0 ppb | 18.0 |
| Trace Impurities – Silver (Ag) | <= 1.0 ppb | < 0.3 |
| Trace Impurities – Sodium (Na) | <= 100.0 ppb | < 5.0 |
| Trace Impurities – Strontium (Sr) | <= 1.0 ppb | < 0.2 |
| Trace Impurities – Tantalum (Ta) | <= 1.0 ppb | < 0.9 |
| Trace Impurities – Thallium (Tl) | <= 5.0 ppb | < 2.0 |
| Trace Impurities – Tin (Sn) | <= 5.0 ppb | < 0.8 |
| Trace Impurities – Titanium (Ti) | <= 1.0 ppb | < 0.2 |
| Trace Impurities – Vanadium (V) | <= 1.0 ppb | < 0.2 |
| Trace Impurities – Zinc (Zn) | <= 5.0 ppb | 0.4 |
| Trace Impurities – Zirconium (Zr) | <= 1.0 ppb | < 0.1 |

For Laboratory, Research or Manufacturing Use

Product Information (not specifications):

Appearance (clear, fuming liquid)

Meets ACS Specifications

Country of Origin: US

Packaging Site: Phillipsburg Mfg Ctr & DC


Jamie Ethier
Vice President Global Quality

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

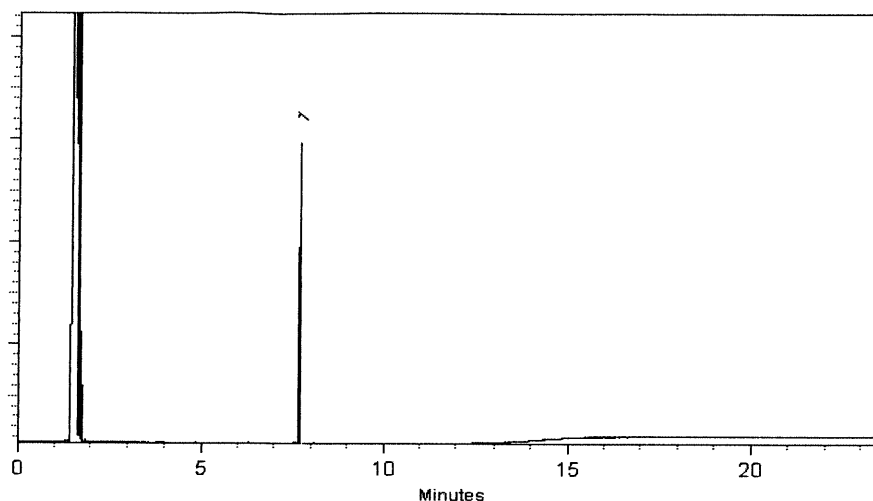
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)


Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Katelyn McGinnis - Operations Tech I

Date Mixed: 28-May-2021 **Balance:** B345965662


Marlene Cowan - Operations Tech I

Date Passed: 02-Jun-2021

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

1911177
70
P 111 86
AR
11/02/21



CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32050 **Lot No.:** A0172864
Description : 2,4-Dichlorophenylacetic Acid Methyl Ester Standard
515 Surrogate (ester) 2, 4-dichlorophenyl Acetic Acid Methyl Ester
200µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL **Pkg Amt:** > 1 mL
Expiration Date : February 29, 2028 **Storage:** 10°C or colder
Handling: This product is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

| Elution Order | Compound | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L.; K=2) |
|---------------|---|-----------------------------|--------------------------------------|
| 1 | 2,4-Dichlorophenyl acetic acid methyl ester | 202.0 µg/mL | +/- 1.4323 µg/mL Gravimetric |
| | CAS # 55954-23-9 (Lot CSC42194-01) | | +/- 6.8182 µg/mL Unstressed |
| | Purity 99% | | +/- 6.8182 µg/mL Stressed |

Solvent: Hexane
CAS # 110-54-3
Purity 99%

P11177
↓
P11186
—
AR
01/02/21

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

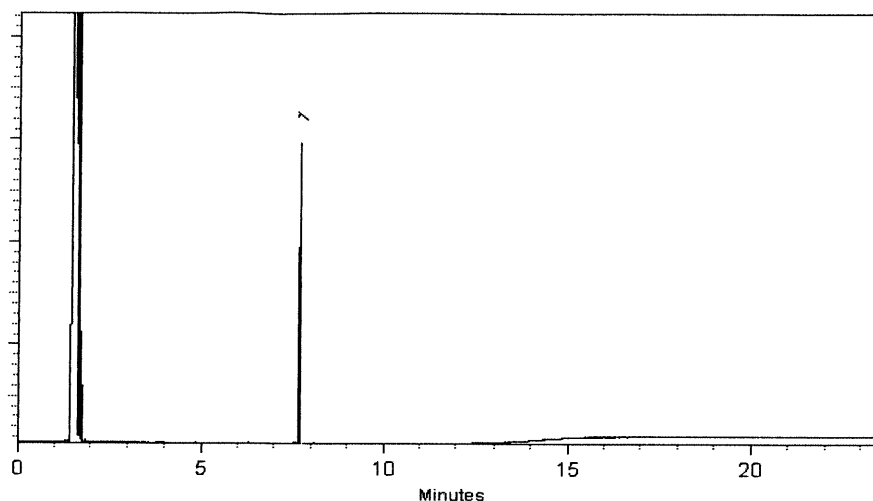
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)


Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Katelyn McGinnis - Operations Tech I

Date Mixed: 28-May-2021 **Balance:** B345965662


Marlene Cowan - Operations Tech I

Date Passed: 02-Jun-2021

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

1911177
70
P 111 86
AR
11/02/21



CERTIFIED REFERENCE MATERIAL

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Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32050 **Lot No.:** A0172864
Description : 2,4-Dichlorophenylacetic Acid Methyl Ester Standard
515 Surrogate (ester) 2, 4-dichlorophenyl Acetic Acid Methyl Ester
200µg/mL, Hexane, 1mL/ampul
Container Size : 2 mL **Pkg Amt:** > 1 mL
Expiration Date : February 29, 2028 **Storage:** 10°C or colder
Handling: This product is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

| Elution Order | Compound | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L.; K=2) |
|---------------|---|-----------------------------|--------------------------------------|
| 1 | 2,4-Dichlorophenyl acetic acid methyl ester | 202.0 µg/mL | +/- 1.4323 µg/mL Gravimetric |
| | CAS # 55954-23-9 (Lot CSC42194-01) | | +/- 6.8182 µg/mL Unstressed |
| | Purity 99% | | +/- 6.8182 µg/mL Stressed |

Solvent: Hexane
CAS # 110-54-3
Purity 99%

P11177
↓
P11186
—
AR
01/02/21



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Certificate of Analysis



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32062 **Lot No.:** A0155055

Description : Herbicide Mix #4/ME (Methyl Ester)

Herbicide Mix #4/ME (Methyl Ester) 200µg/mL,
Hexane/Methyl-tert-butyl-ether, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : November 30, 2026 **Storage:** 10°C or colder

P12616 / (5)
↓
P12620
✓ *Paul* = 7/5/2023

CERTIFIED VALUES

| Elution Order | Compound | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L.; K=2) | | | |
|---------------|---|-----------------------------|--------------------------------------|-------|-------------|--|
| 1 | 3,5-Dichlorobenzoic acid methyl ester CAS # 2905-67-1 (Lot 3903900) Purity 99% | 200.0 µg/mL | +/- 1.4182 | µg/mL | Gravimetric | |
| | | | +/- 6.7507 | µg/mL | Unstressed | |
| | | | +/- 6.7507 | µg/mL | Stressed | |
| 2 | 4-Nitroanisole CAS # 100-17-4 (Lot 24765/7) Purity 99% | 200.0 µg/mL | +/- 1.4182 | µg/mL | Gravimetric | |
| | | | +/- 6.7507 | µg/mL | Unstressed | |
| | | | +/- 6.7507 | µg/mL | Stressed | |
| 3 | Pentachloroanisole CAS # 1825-21-4 (Lot 7921100) Purity 99% | 200.0 µg/mL | +/- 1.4182 | µg/mL | Gravimetric | |
| | | | +/- 6.7507 | µg/mL | Unstressed | |
| | | | +/- 6.7507 | µg/mL | Stressed | |
| 4 | Chloramben methyl ester CAS # 7286-84-2 (Lot 6487100) Purity 98% | 199.9 µg/mL | +/- 1.4176 | µg/mL | Gravimetric | |
| | | | +/- 6.7480 | µg/mL | Unstressed | |
| | | | +/- 6.7480 | µg/mL | Stressed | |
| 5 | Bentazon methyl ester CAS # 61592-45-8 (Lot 817100) Purity 99% | 200.0 µg/mL | +/- 1.4182 | µg/mL | Gravimetric | |
| | | | +/- 6.7507 | µg/mL | Unstressed | |
| | | | +/- 6.7507 | µg/mL | Stressed | |
| 6 | Picloram methyl ester CAS # 14143-55-6 (Lot 386-21B) Purity 98% | 201.9 µg/mL | +/- 1.4315 | µg/mL | Gravimetric | |
| | | | +/- 6.8141 | µg/mL | Unstressed | |
| | | | +/- 6.8141 | µg/mL | Stressed | |
| 7 | DCPA methyl ester (Chlorthal-dimethyl) CAS # 1861-32-1 (Lot 8008700) Purity 99% | 200.0 µg/mL | +/- 1.4182 | µg/mL | Gravimetric | |
| | | | +/- 6.7507 | µg/mL | Unstressed | |
| | | | +/- 6.7507 | µg/mL | Stressed | |

| | | | | | | | |
|---|--------------------------|---------------|-------------|-----|--------|-------|-------------|
| 8 | Acifluorfen methyl ester | | 200.0 µg/mL | +/- | 1.4182 | µg/mL | Gravimetric |
| | CAS # 50594-67-7 | (Lot 6282300) | | +/- | 6.7507 | µg/mL | Unstressed |
| | Purity 99% | | | +/- | 6.7507 | µg/mL | Stressed |

Solvent: Hexane/Methyl-tert-butyl-ether
CAS # 110-54-3/1634-04-4
Purity 99%

Column:
 30m x 0.25mm x 0.25µm
 Rtx-5 (cat.#10223)

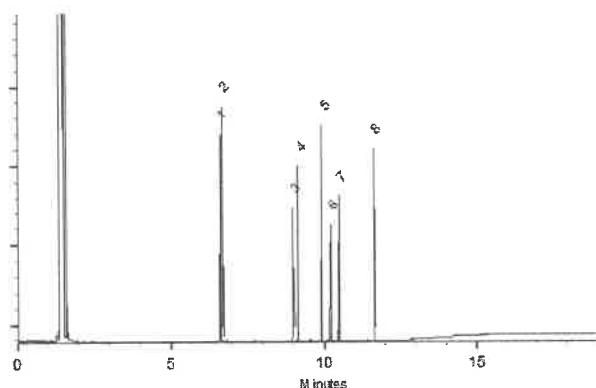
Carrier Gas:
 hydrogen-constant pressure 10 psi.

Temp. Program:
 75°C (hold 1 min.) to 330°C
 @ 20°C/min. (hold 10 min.)

Inj. Temp:
 250°C

Det. Temp:
 330°C

Det. Type:
 FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Michael Maje

Date Mixed: 14-Nov-2019 **Balance:** 1128353505

Justine Albertson
 Justine Albertson - Operations Tech-ARM QC

Date Passed: 18-Nov-2019

Manufactured under Restek's ISO 9001:2015
 Registered Quality System
 Certificate #FM 80397



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis chromatographic plus



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32055 **Lot No.:** A0192429

Description : Herbicide Mix #1/ME (Methyl Ester)
Herbicide Mix #1/ME (Methyl Ester) 200 µg/mL, Hexane, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : December 31, 2029 **Storage:** 10°C or colder

Handling: This product is photosensitive. **Ship:** Ambient

P12626 / 5
P12630
7/5/2023

CERTIFIED VALUES

| Elution Order | Compound | CAS # | Lot # | Purity | Grav. Conc. (weight/volume) | Expanded Uncertainty * (95% C.L.; K=2) |
|---------------|--------------------------------|------------|----------|--------|-----------------------------|--|
| 1 | Dicamba methyl ester | 6597-78-0 | 11705400 | 99% | 201.6 µg/mL | +/- 3.4204 |
| 2 | Dichlorprop methyl ester | 57153-17-0 | 11672100 | 99% | 201.4 µg/mL | +/- 3.4170 |
| 3 | 2,4-D methyl ester | 1928-38-7 | 10048000 | 99% | 201.2 µg/mL | +/- 3.4136 |
| 4 | 2,4,5-TP (silvex) methyl ester | 4841-20-7 | 6364900 | 99% | 201.2 µg/mL | +/- 3.4136 |
| 5 | 2,4,5-T methyl ester | 1928-37-6 | 6875800 | 98% | 200.7 µg/mL | +/- 3.4052 |
| 6 | Dinoseb methyl ether | 6099-79-2 | 12914300 | 99% | 200.8 µg/mL | +/- 3.4068 |
| 7 | 2,4-DB methyl ester | 18625-12-2 | 12542000 | 99% | 201.0 µg/mL | +/- 3.4102 |

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Quality Confirmation Test

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

Inj. Temp:

250°C

Det. Temp:

330°C

Det. Type:

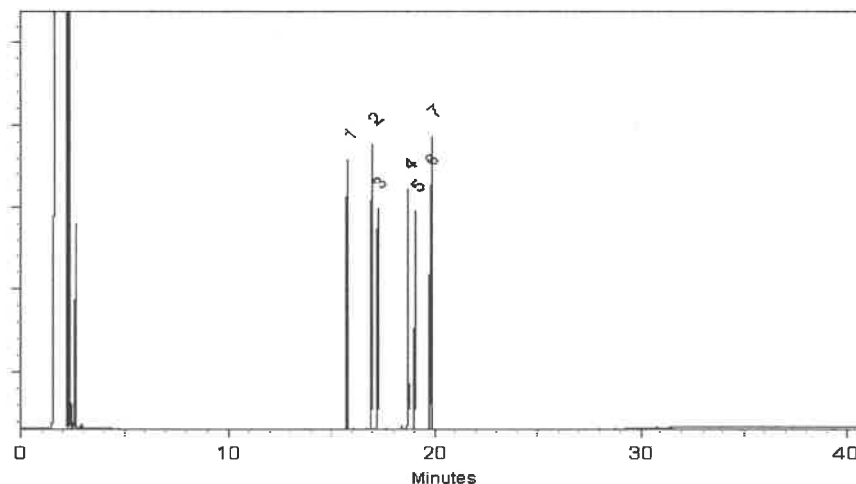
FID

Split Vent:

2 ml/min.

Inj. Vol

1µl



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Penelope Riglin - Operations Tech I

Date Mixed: 09-Dec-2022

Balance Serial # 1128360905


Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 12-Dec-2022

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397



110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis chromatographic plus



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32059 **Lot No.:** A0199844

Description : Herbicide Mix #3/ME (Methyl Ester)
Herbicide Mix #3/ME (Methyl Ester) 20,000 µg/mL, Hexane, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : July 31, 2030 **Storage:** 10°C or colder

Handling: This product is photosensitive. **Ship:** Ambient

P 12685 / (S)
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P 12689
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RAU = 7/24/23

CERTIFIED VALUES

| Elution Order | Compound | CAS # | Lot # | Purity | Grav. Conc. (weight/volume) | Expanded Uncertainty * (95% C.L.; K=2) |
|---------------|------------------------------|------------|----------|--------|-----------------------------|--|
| 1 | MCPP (Mecoprop) methyl ester | 23844-56-6 | 14546400 | 99% | 20,035.0 µg/mL | +/- 360.1907 |
| 2 | MCPA methyl ester | 2436-73-9 | SL201209 | 99% | 20,055.0 µg/mL | +/- 360.5503 |

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Quality Confirmation Test

Column:

30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:

hydrogen-constant pressure 10 psi.

Temp. Program:

75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:

250°C

Det. Temp:

330°C

Det. Type:

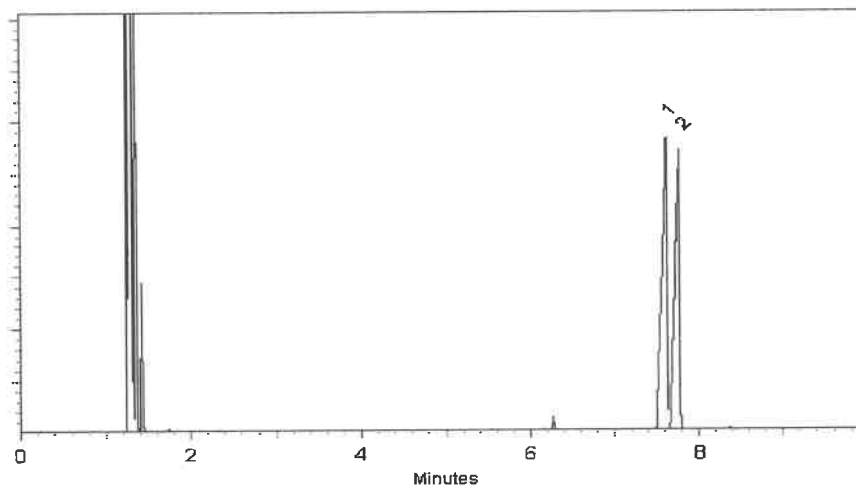
FID

Split Vent:

10 ml/min.

Inj. Vol

1µl



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Morgan Craighead - Mix Technician

Date Mixed: 12-Jul-2023

Balance Serial # B442140311


Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 19-Jul-2023

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

P12706
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P12715
/ (10)
/ 1
/ 8/15/23

ISO 17034

Reference Material Certificate
Product Information Sheet

Product Name: Chlorinated Methylated Herbicides Standard

Lot Number: 0006752480

Product Number: HBM-8151M-1

Lot Issue Date: 18-Jul-2023

Storage Conditions: Store at Room Temperature (15° to 30°C).

Expiration Date: 31-Aug-2025

| Component Name | Concentration | Uncertainty | CAS# | Analyte Lot |
|-----------------------------|---------------|-------------|-------------|-------------|
| acifluorfen methyl ester | 100.3 ± | 0.5 µg/mL | 050594-67-7 | RM03058 |
| bentazon methyl derivative | 100.2 ± | 0.5 µg/mL | 061592-45-8 | RM13829 |
| chloramben methyl ester | 100.4 ± | 0.5 µg/mL | 007286-84-2 | RM03055 |
| 2,4-D methyl ester | 100.2 ± | 0.5 µg/mL | 001928-38-7 | RM03040 |
| dalapon methyl ester | 100.4 ± | 0.5 µg/mL | 017640-02-7 | RM14219 |
| 2,4-DB methyl ester | 100.2 ± | 0.5 µg/mL | 018625-12-2 | RM03029 |
| DCPA | 100.2 ± | 0.5 µg/mL | 001861-32-1 | RM13426 |
| dicamba methyl ester | 100.4 ± | 0.5 µg/mL | 006597-78-0 | RM03039 |
| methyl-3,5-dichlorobenzoate | 100.1 ± | 0.5 µg/mL | 002905-67-1 | RM03048 |
| dichlorprop methyl ester | 100.4 ± | 0.5 µg/mL | 057153-17-0 | NT02086 |
| dinoseb methyl ether | 100.5 ± | 0.5 µg/mL | 006099-79-2 | RM03051 |
| MCPA methyl ester | 10031 ± | 50 µg/mL | 002436-73-9 | RM12863 |
| MCPP methyl ester | 10031 ± | 50 µg/mL | 023844-56-6 | RM20060 |
| 4-nitroanisole | 100.3 ± | 0.5 µg/mL | 000100-17-4 | RM02806 |
| pentachloroanisole | 100.4 ± | 0.5 µg/mL | 001825-21-4 | RM02457 |
| picloram methyl ester | 100.2 ± | 0.5 µg/mL | 014143-55-6 | RM03044 |
| silvex methyl ester | 100.2 ± | 0.5 µg/mL | 004841-20-7 | RM03799 |
| 2,4,5-T methyl ester | 100.4 ± | 0.5 µg/mL | 001928-37-6 | RM03033 |

Matrix: methanol (methyl alcohol)

Description:

This document is prepared in accordance with ISO 17034 and Guide 31. This analytical reference material standard was manufactured and verified in accordance with an ISO 9001 registered quality system and analyte concentrations were verified by an ISO 17025 accredited laboratory. The concentration and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed above.

Traceability:

The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z540.3, ISO 9001, ISO 17025, and ISO 17034. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 1088.

Homogeneity:

This analytical reference standard was unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

**Instructions for Use:**

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening the container and should be processed without delay for the certified values to be valid within the stated uncertainties.

Safety:

Refer to the Safety Data Sheet on www.agilent.com for information regarding this analytical reference material.

Intended Use:

This analytical reference standard is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods, and continuing calibration verification.

Expiration of Certification:

The certification of this analytical reference standard is valid until the expiration date specified above, provided the material is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the material is damaged, contaminated, or otherwise modified.

Maintenance of Certification:

If substantive changes are noted that affect the certification before the expiration of this certificate, Agilent will notify the purchaser.

Sample lot approver:


Monica Bourgeois
QMS Representative

P12706 / (10)
↓
P12715
✓ RAUF
8.15.23



ISO 17034
Cert No. AR-1936

RM was produced in accordance with the TUV/SUD registered ISO
9001:2015 Quality Management System. Cert# 951215321

Page: 2 of 2

www.agilent.com/quality/
CSD-QA-015.2

ISO 17025
Cert No. AT-1937

P12706
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P12715
/ (10)
/ 1
/ 8/15/23

ISO 17034

Reference Material Certificate
Product Information Sheet

Product Name: Chlorinated Methylated Herbicides Standard

Lot Number: 0006752480

Product Number: HBM-8151M-1

Lot Issue Date: 18-Jul-2023

Storage Conditions: Store at Room Temperature (15° to 30°C).

Expiration Date: 31-Aug-2025

| Component Name | Concentration | Uncertainty | CAS# | Analyte Lot |
|-----------------------------|---------------|-------------|-------------|-------------|
| acifluorfen methyl ester | 100.3 ± | 0.5 µg/mL | 050594-67-7 | RM03058 |
| bentazon methyl derivative | 100.2 ± | 0.5 µg/mL | 061592-45-8 | RM13829 |
| chloramben methyl ester | 100.4 ± | 0.5 µg/mL | 007286-84-2 | RM03055 |
| 2,4-D methyl ester | 100.2 ± | 0.5 µg/mL | 001928-38-7 | RM03040 |
| dalapon methyl ester | 100.4 ± | 0.5 µg/mL | 017640-02-7 | RM14219 |
| 2,4-DB methyl ester | 100.2 ± | 0.5 µg/mL | 018625-12-2 | RM03029 |
| DCPA | 100.2 ± | 0.5 µg/mL | 001861-32-1 | RM13426 |
| dicamba methyl ester | 100.4 ± | 0.5 µg/mL | 006597-78-0 | RM03039 |
| methyl-3,5-dichlorobenzoate | 100.1 ± | 0.5 µg/mL | 002905-67-1 | RM03048 |
| dichlorprop methyl ester | 100.4 ± | 0.5 µg/mL | 057153-17-0 | NT02086 |
| dinoseb methyl ether | 100.5 ± | 0.5 µg/mL | 006099-79-2 | RM03051 |
| MCPA methyl ester | 10031 ± | 50 µg/mL | 002436-73-9 | RM12863 |
| MCPP methyl ester | 10031 ± | 50 µg/mL | 023844-56-6 | RM20060 |
| 4-nitroanisole | 100.3 ± | 0.5 µg/mL | 000100-17-4 | RM02806 |
| pentachloroanisole | 100.4 ± | 0.5 µg/mL | 001825-21-4 | RM02457 |
| picloram methyl ester | 100.2 ± | 0.5 µg/mL | 014143-55-6 | RM03044 |
| silvex methyl ester | 100.2 ± | 0.5 µg/mL | 004841-20-7 | RM03799 |
| 2,4,5-T methyl ester | 100.4 ± | 0.5 µg/mL | 001928-37-6 | RM03033 |

Matrix: methanol (methyl alcohol)

Description:

This document is prepared in accordance with ISO 17034 and Guide 31. This analytical reference material standard was manufactured and verified in accordance with an ISO 9001 registered quality system and analyte concentrations were verified by an ISO 17025 accredited laboratory. The concentration and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed above.

Traceability:

The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z540.3, ISO 9001, ISO 17025, and ISO 17034. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 1088.

Homogeneity:

This analytical reference standard was unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

**Instructions for Use:**

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening the container and should be processed without delay for the certified values to be valid within the stated uncertainties.

Safety:

Refer to the Safety Data Sheet on www.agilent.com for information regarding this analytical reference material.

Intended Use:

This analytical reference standard is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods, and continuing calibration verification.

Expiration of Certification:

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Maintenance of Certification:

If substantive changes are noted that affect the certification before the expiration of this certificate, Agilent will notify the purchaser.

Sample lot approver:


Monica Bourgeois
QMS Representative

P12706 / (10)
↓
P12715
✓ RAUF
8.15.23



ISO 17034
Cert No. AR-1936

RM was produced in accordance with the TUV/SUD registered ISO
9001:2015 Quality Management System. Cert# 951215321

Page: 2 of 2

www.agilent.com/quality/
CSD-QA-015.2

ISO 17025
Cert No. AT-1937



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Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32049 **Lot No.:** A0212676
Description : 2,4-Dichlorophenylacetic Acid Standard
2, 4-Dichlorophenyl Acetic Acid 200µg/mL, Methanol, 1mL/ampul
Container Size : 2 mL **Pkg Amt:** > 1 mL
Expiration Date : March 31, 2027 **Storage:** 10°C or colder
Handling: This product is photosensitive. **Ship:** Ambient

P13697 } Y.P.
↓
P13515 } 08/15/24

CERTIFIED VALUES

| Elution Order | Compound | CAS # | Lot # | Purity | Grav. Conc. (weight/volume) | Expanded Uncertainty * (95% C.L.; K=2) |
|---------------|-------------------------------|------------|----------|--------|-----------------------------|--|
| 1 | 2,4-dichlorophenylacetic acid | 19719-28-9 | STBK3827 | 99% | 200.0 µg/mL | +/- 2.7154 |

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Methanol
CAS # 67-56-1
Purity 99%

Specific Reference Material Notes:

Failure to derivatize this standard will lead to incorrect quantitative results.

Quality Confirmation Test

Column:

150mm x 4.6mm
Allure C18 Cat. (#9164565)

Flow Rate:

1.0 ml/min.

Mobile Phase A:

0.14% H₃PO₄ in water

Mobile Phase B:

acetonitrile

Mobile Phase Composition:

90%B Isocratic

Det. Type:

Wavelength: 220 & 254 nm

Inj. Vol

5µl



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Ethan Winiarski - Operations Tech I

Date Mixed: 11-Jun-2024

Balance Serial # B345965662


Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 13-Jun-2024

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ μ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ uncertainty} = k \sqrt{u_{gravimetric}^2 + u_{homogeneity}^2 + u_{storage\ stability}^2 + u_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampuls. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.



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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32049 **Lot No.:** A0212676
Description : 2,4-Dichlorophenylacetic Acid Standard
2, 4-Dichlorophenyl Acetic Acid 200µg/mL, Methanol, 1mL/ampul
Container Size : 2 mL **Pkg Amt:** > 1 mL
Expiration Date : March 31, 2027 **Storage:** 10°C or colder
Handling: This product is photosensitive. **Ship:** Ambient

P13697 } Y.P.
↓
P13515 } 08/15/24

CERTIFIED VALUES

| Elution Order | Compound | CAS # | Lot # | Purity | Grav. Conc. (weight/volume) | Expanded Uncertainty * (95% C.L.; K=2) |
|---------------|-------------------------------|------------|----------|--------|-----------------------------|--|
| 1 | 2,4-dichlorophenylacetic acid | 19719-28-9 | STBK3827 | 99% | 200.0 µg/mL | +/- 2.7154 |

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Methanol
CAS # 67-56-1
Purity 99%

Specific Reference Material Notes:

Failure to derivatize this standard will lead to incorrect quantitative results.

Quality Confirmation Test

Column:

150mm x 4.6mm
Allure C18 Cat. (#9164565)

Flow Rate:

1.0 ml/min.

Mobile Phase A:

0.14% H₃PO₄ in water

Mobile Phase B:

acetonitrile

Mobile Phase Composition:

90%B Isocratic

Det. Type:

Wavelength: 220 & 254 nm

Inj. Vol

5µl



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Ethan Winiarski - Operations Tech I

Date Mixed: 11-Jun-2024

Balance Serial # B345965662


Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 13-Jun-2024

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ uncertainty} = k \sqrt{u_{gravimetric}^2 + u_{homogeneity}^2 + u_{storage\ stability}^2 + u_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampuls. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.



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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32049 **Lot No.:** A0212676
Description : 2,4-Dichlorophenylacetic Acid Standard
2, 4-Dichlorophenyl Acetic Acid 200µg/mL, Methanol, 1mL/ampul
Container Size : 2 mL **Pkg Amt:** > 1 mL
Expiration Date : March 31, 2027 **Storage:** 10°C or colder
Handling: This product is photosensitive. **Ship:** Ambient

P13697 } Y.P.
↓
P13515 } 08/15/24

CERTIFIED VALUES

| Elution Order | Compound | CAS # | Lot # | Purity | Grav. Conc. (weight/volume) | Expanded Uncertainty * (95% C.L.; K=2) |
|---------------|-------------------------------|------------|----------|--------|-----------------------------|--|
| 1 | 2,4-dichlorophenylacetic acid | 19719-28-9 | STBK3827 | 99% | 200.0 µg/mL | +/- 2.7154 |

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Methanol
CAS # 67-56-1
Purity 99%

Specific Reference Material Notes:

Failure to derivatize this standard will lead to incorrect quantitative results.

Quality Confirmation Test

Column:

150mm x 4.6mm
Allure C18 Cat. (#9164565)

Flow Rate:

1.0 ml/min.

Mobile Phase A:

0.14% H₃PO₄ in water

Mobile Phase B:

acetonitrile

Mobile Phase Composition:

90%B Isocratic

Det. Type:

Wavelength: 220 & 254 nm

Inj. Vol

5µl



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Ethan Winiarski - Operations Tech I

Date Mixed: 11-Jun-2024

Balance Serial # B345965662


Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 13-Jun-2024

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

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- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

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k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus



FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32049 **Lot No.:** A0212676
Description : 2,4-Dichlorophenylacetic Acid Standard
2, 4-Dichlorophenyl Acetic Acid 200µg/mL, Methanol, 1mL/ampul
Container Size : 2 mL **Pkg Amt:** > 1 mL
Expiration Date : March 31, 2027 **Storage:** 10°C or colder
Handling: This product is photosensitive. **Ship:** Ambient

P13697 } Y.P.
↓
P13515 } 08/15/24

CERTIFIED VALUES

| Elution Order | Compound | CAS # | Lot # | Purity | Grav. Conc. (weight/volume) | Expanded Uncertainty * (95% C.L.; K=2) |
|---------------|-------------------------------|------------|----------|--------|-----------------------------|--|
| 1 | 2,4-dichlorophenylacetic acid | 19719-28-9 | STBK3827 | 99% | 200.0 µg/mL | +/- 2.7154 |

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Methanol
CAS # 67-56-1
Purity 99%

Specific Reference Material Notes:

Failure to derivatize this standard will lead to incorrect quantitative results.

Quality Confirmation Test

Column:

150mm x 4.6mm
Allure C18 Cat. (#9164565)

Flow Rate:

1.0 ml/min.

Mobile Phase A:

0.14% H₃PO₄ in water

Mobile Phase B:

acetonitrile

Mobile Phase Composition:

90%B Isocratic

Det. Type:

Wavelength: 220 & 254 nm

Inj. Vol

5µl



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.


Ethan Winiarski - Operations Tech I

Date Mixed: 11-Jun-2024

Balance Serial # B345965662


Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 13-Jun-2024

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
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Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ uncertainty} = k \sqrt{u_{gravimetric}^2 + u_{homogeneity}^2 + u_{storage\ stability}^2 + u_{shipping\ stability}^2}$$

k is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampuls. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reference Material Certificate
Product Information Sheet

Product Name: Chlorinated Herbicides Standard
Product Number: HBM-8151A-1
Storage Conditions: Store at Room Temperature (15° to 30°C).

Lot Number: 0006810955
Lot Issue Date: 20-Aug-2024
Expiration Date: 30-Sep-2026

| Component Name | Concentration | Uncertainty | CAS# | Analyte Lot |
|------------------------------|---------------|-------------|-------------|-------------|
| acifluorfen | 100.2 ± | 0.5 µg/mL | 050594-66-6 | NT02057 |
| bentazon | 100.4 ± | 0.5 µg/mL | 025057-89-0 | RM21359 |
| chloramben | 100.3 ± | 0.5 µg/mL | 000133-90-4 | RM02698 |
| 2,4-D | 100.4 ± | 0.5 µg/mL | 000094-75-7 | RM17172 |
| dalapon | 100.4 ± | 0.5 µg/mL | 000075-99-0 | RM19677 |
| 2,4-DB | 100.1 ± | 0.5 µg/mL | 000094-82-6 | RM02866 |
| tetrachloroterephthalic acid | 100.4 ± | 0.5 µg/mL | 002136-79-0 | RM15140 |
| dicamba | 100.3 ± | 0.5 µg/mL | 001918-00-9 | RM22113 |
| 3,5-dichlorobenzoic acid | 100.4 ± | 0.5 µg/mL | 000051-36-5 | RM02768 |
| dichlorprop | 100.2 ± | 0.5 µg/mL | 000120-36-5 | RM21688 |
| dinoseb | 100.3 ± | 0.5 µg/mL | 000088-85-7 | RM22275 |
| MCPA | 10019 ± | 50 µg/mL | 000094-74-6 | RM12220 |
| MCPP (mecoprop) | 10011 ± | 50 µg/mL | 000093-65-2 | RM09273 |
| 4-nitrophenol | 100.4 ± | 0.5 µg/mL | 000100-02-7 | RM02391 |
| pentachlorophenol | 100.2 ± | 0.5 µg/mL | 000087-86-5 | RM02474 |
| picloram | 100.4 ± | 0.5 µg/mL | 001918-02-1 | RM20442 |
| silvex | 100.5 ± | 0.5 µg/mL | 000093-72-1 | RM22116 |
| 2,4,5-T | 100.3 ± | 0.5 µg/mL | 000093-76-5 | RM19314 |

Matrix: methanol (methyl alcohol)

Description:

This document is prepared in accordance with ISO 17034 and Guide 31. This analytical reference material standard was manufactured and verified in accordance with an ISO 9001 registered quality system and analyte concentrations were verified by an ISO 17025 accredited laboratory. The concentration and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed above.

Traceability:

The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z540.3, ISO 9001, ISO 17025, and ISO 17034. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 1088.

Homogeneity:

This analytical reference standard was unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

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**Reference Material Certificate
Product Information Sheet**

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| dalapon | 100.4 ± | 0.5 µg/mL | 000075-99-0 | RM19677 |
| 2,4-DB | 100.1 ± | 0.5 µg/mL | 000094-82-6 | RM02866 |
| tetrachloroterephthalic acid | 100.4 ± | 0.5 µg/mL | 002136-79-0 | RM15140 |
| dicamba | 100.3 ± | 0.5 µg/mL | 001918-00-9 | RM22113 |
| 3,5-dichlorobenzoic acid | 100.4 ± | 0.5 µg/mL | 000051-36-5 | RM02768 |
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| MCPA | 10019 ± | 50 µg/mL | 000094-74-6 | RM12220 |
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| 4-nitrophenol | 100.4 ± | 0.5 µg/mL | 000100-02-7 | RM02391 |
| pentachlorophenol | 100.2 ± | 0.5 µg/mL | 000087-86-5 | RM02474 |
| picloram | 100.4 ± | 0.5 µg/mL | 001918-02-1 | RM20442 |
| silvex | 100.5 ± | 0.5 µg/mL | 000093-72-1 | RM22116 |
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9/4/2024

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