

**Catalog Number:** PT-TP-F17**Lot No.** TS171013013A**Description:** Emerald Fall 2017 Terpene PT**Ship Date:** 11-10-2017**Matrix:** Hempseed Oil**Expiration Date:** 11-10-2018

This Certified Reference Material (CRM) is intended primarily for use as a calibration or quality control standard for organic chromatography instrumentation such as GC, GC/MS, HPLC, and LC/MS. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

**Long Term Storage:** Freezer (-35°C to -10°C)**Certified Compounds:**

<u>Compound</u>	<u>CAS #</u>	<u>Labeled</u>	<u>Purity</u>	<u>Certified†</u>	<u>Uncertainty</u>
a-Pinene	80-56-8	550 µg/g	98%	552 µg/g	± 20 µg/g
beta-Pinene	127-91-3	500 µg/g	95%	500 µg/g	± 18 µg/g
beta-Myrcene	123-35-3	1500 µg/g	92.1%	1499 µg/g	± 54 µg/g
3-Carene	13466-78-9	50 µg/g	95.4%	49.6 µg/g	± 1.8 µg/g
alpha-Terpinene	99-86-5	400 µg/g	95.2%	399 µg/g	± 14 µg/g
(R)-(+)-Limonene	5989-27-5	600 µg/g	97%	598 µg/g	± 22 µg/g
Linalool	78-70-6	100 µg/g	97%	100 µg/g	± 3.6 µg/g
trans-Caryophyllene	87-44-5	400 µg/g	98.5%	400 µg/g	± 14 µg/g
alpha-Humulene	6753-98-6	125 µg/g	96%	126 µg/g	± 4.5 µg/g
(-)-Alpha-Bisabolol	23089-26-1	50 µg/g	95%	50.1 µg/g	± 1.8 µg/g

**Final Solution Verification:**

Final solution integrity verified by Gas Chromatography/Mass Spectrometry. The mass spectrum of each compound was confirmed against the NIST mass spectral database. beta-Myrcene has a purity of 92.1% with the balance unknown.

† Certified concentration based on gravimetric weights and corrected for the purity of the compound(s) used to prepare the standard. Analytical balance calibration is verified daily with C1 weight set #23-190006 which is registered with Atlantic Scale, traceable to NIST and NJ Division of Weights and Measures.

This CRM is guaranteed stable and accurate to within the uncertainty listed above. This includes uncertainty components due preparation, homogeneity, short term and long term stability. During the stated period of validity, the purchaser will be notified this product is recalled due to any significant changes in the stability of the solution. For further information, contact Emerald Scientific.

Date of Certification: 11-10-2017Certifying Officer: 

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**This Certified Reference Material (CRM) has been prepared and certified under an ISO 9001:2008, ISO 17025:2005, and ISO Guide 34:2009 Quality System consistent with the following standards. This CRM was produced by an A2LA accredited reference material producer, certificate number 2495.01.**

- ISO 9001:2008: Quality management systems - Requirements - Certified by UL-DQS
- ISO 17025:2005: General Requirements for the Competence of Testing and Calibration Laboratories - Accredited by A2LA
- ISO Guide 34:2009: General Requirements for the Competence of Reference Material Producers - Accredited by A2LA
- ISO Guide 31:2000: Reference Materials - Contents of Certificates and Labels
- ISO Guide 35:2006: Reference Materials - General and statistical principals for certification
- Guide to the Expression of Uncertainty in Measurement 1997
- EURACHEM/CITAC Guide: Qualifying Uncertainty in Analytical Measurements - Second Edition
- ASTM Guide D6362-98
- NIST Technical Note 1297
- ILAC-G12-2000: Guidelines for the requirements for the competence of reference material producers
- ISO/REMCO N280

#### **Storage Requirements:**

To ensure the stability of the product once it arrives in your laboratory, please store this product in a freezer(-35°C to -10°C). Note: Shipping conditions may differ from storage conditions. The EXPIRATION DATE is calculated from the SHIPPED DATE using our stability data and is applicable only if product is unopened and stored under the prescribed conditions.

#### **Instructions for Use:**

Let material come to room temperature before use. Check for precipitate and if necessary sonicate for one minute. If compounds do not dissolve at one minute then sonicate further until the product is dissolved. A clear appearance is acceptable. The minimum recommended amount that should be removed from this vial is 5µL with a 25µL gas tight syringe. All solutions should be thoroughly mixed, by shaking, prior to use. All surfaces that come in contact with the solution must be thoroughly cleaned prior to use. Dilutions should be performed only with Class A volumetric glassware.

#### **Material Source:**

All analytes and matrix materials are obtained and verified from pre-qualified vendors as per ISO 9001:2008, ISO 17025:2005, and ISO Guide 34:2009 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of CRMs are tracked and documented.

#### **Method of Preparation:**

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, and analytical instrumentation have been qualified prior to use. The highest purity solvents and Class A/ calibrated volumetrics have been used in all preparations.

#### **Homogeneity:**

The homogeneity of this CRM has been confirmed by procedures consistent with ISO 17025:2005, ISO Guide 34:2009, and ASTM D6362-98 Appen X2. Random, replicate samples of the final, packaged material have been analyzed to prove homogeneity in accordance with our internal procedure 4300-HOMOGEN-1A. Since the product is highly homogeneous, any sample size taken for analysis would be within the uncertainty budget. This is consistent with the intended use of the CRM.

#### **Statistical Estimator and Confidence Limits:**

The Certified value 'X' as listed on the reverse of this document is at the 95% level of confidence and can be expressed as:

- $X = x \pm U$  where X=certified value, U=expanded uncertainty, x=property value
- $U = k u_c$  where k=2 is the coverage factor at the 95% confidence level
- $u_c = \sqrt{\sum u_i^2}$  where  $u_c$  = combined standard uncertainty obtained by combining the individual compound standard uncertainty components  $u_i$

#### **Legal Notice:**

Product intended for laboratory use only. Emerald Scientific warrants that its products conform to the information contained in this publication. Purchaser must determine the suitability of the product for its particular use. Please see the latest catalog or order invoice and packing slip for additional terms and conditions of sale.