

# Certificate of Analysis

## 18 Terpene Mix

**Catalog Number:** C-937  
**Lot Number:** 230221  
**Manufacture Date:** 02/21/2023

**Expiration:** 02/28/2025  
**Solvent:** Hexane  
**Hazards:** Irritant, Flammable

<u>Analyte</u>	<u>CAS</u>	<u>Analyte Purity</u>	<u>Certified Concentration (ug/mL)</u>	<u>Uncertainty</u>
alpha-Pinene	80-56-8	98.3%	2500.0	± 23.3
Sabinene	3387-41-5	77.5%	2500.0	± 23.3
beta-Pinene	127-91-3	99.3%	2502.7	± 23.3
alpha-Terpinene	99-86-5	97.2%	2500.1	± 23.3
d-limonene	5989-27-5	99.5%	2500.0	± 23.3
gamma-Terpinene	99-85-4	98.7%	2500.1	± 23.3
Sabinene hydrate	546-79-2	98.0%	2500.6	± 23.3
Terpinolene	586-62-9	95.0%	2500.1	± 23.3
(1R)-(-)-Fenchone	7787-20-4	99.3%	2499.9	± 23.3
(1R)-endo-(+)-Fenchyl Alcohol	115823	99.3%	2498.4	± 23.3
(+)-Borneol	464-43-7	99.9%	2497.9	± 23.3
Terpineol	8000-41-7	96.8%	2499.4	± 23.3
(+)-Pulegone	89-82-7	97.7%	2499.9	± 23.3
Geraniol	106-24-1	99.1%	2500.0	± 23.3
(-)-alpha-Cedrene	469-61-4	94.5%	2504.3	± 23.3
alpha-Humulene	6753-98-6	96.1%	2499.9	± 23.3
trans-Nerolidol	40716-66-3	95.4%	2500.2	± 23.3
(-)-Guaiol	489-86-1	99.2%	2497.1	± 23.2

This certified reference material (CRM) was manufactured and certified by NSI Lab Solutions according to quality procedures meeting our accreditation requirements of ISO/IEC 17034:2016 and ISO/IEC 17025:2017. Our certificates and scopes of accreditation may be viewed at [www.anab.org](http://www.anab.org).

### Packaging, Storage, Instructions For Use

This CRM is packaged in a flame-sealed ampule and must be stored at -10°C to -20°C. To use this CRM, allow it to reach room temperature. Mix it gently by inversion. Inspect for precipitate. If present, sonicate for a few minutes to redissolve. Open the ampule and withdraw an aliquot appropriate for your application.

### Traceability Information

**Analyte Source Materials:** All analytes and matrix materials are obtained and verified by NSI from pre-qualified vendors as per ISO guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of NSI CRMs are tracked and documented.

**Method of Preparation:** This CRM was verified Volumetrically/Gravimetrically and Analytically. Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, and analytical instrumentation have been qualified prior to use as per ISO/IEC 17025 requirements.

**Balance:** All analytical balances are calibrated on a semiannual basis by an ISO/IEC 17025 accredited calibration laboratory and are traceable to NIST. Traceable Calibration Certificate available upon request.

All balances are checked daily by an in-house standard operating procedure. The weights used for this daily verification are calibrated annually by an ISO/IEC 17025 accredited calibration laboratory and are certified traceable to NIST. Certificate of Calibration and Traceability available upon request.



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**Thermometer:** All thermometers are NIST traceable through thermometers that are calibrated annually by an ISO 17025 accredited calibration laboratory.

**Glassware:** All glassware used in the manufacture of our standards is Class A. An in-house standard operating procedure is used to verify all glassware prior to it being placed into service. Volumetric pipetors are calibrated every four months by an ISO/IEC 17025 accredited calibration laboratory.

**Certified Concentration:** Certified concentration is the made to manufacture value corrected for the determined analyte purity.

#### Intended Uses

- Calibration of analytical instruments
- Validation of analytical methods
- Preparation of working level reference materials, i.e. "check standards"
- Detection limit studies

#### Homogeneity

The homogeneity of this CRM has been confirmed by procedures consistent with ISO Guide 35:2012. This CRM was thoroughly mixed in production and is guaranteed homogenous.

#### Uncertainty:

The  $\pm$  uncertainty of the certified concentration is the expanded uncertainty at the 95% Confidence Interval (CI) with  $K=2$ . This expanded uncertainty incorporates contributions from manufacturing, homogeneity, shipping and long term stability.

*Ken Grzybowski*

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Ken Grzybowski, Certifying Officer

*Quentisha Forrester*

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Quentisha Forrester, Quality Lead