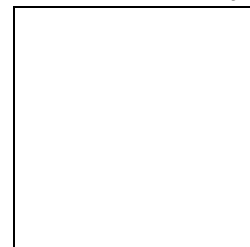




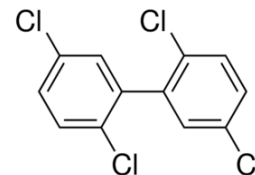
Distributed by :



PCB 052

Certificate of Analysis

Product code: P013S010IOEA
Batch # P013A161118Ab
Expiration date: November 18th 2017
Storage: 4°C±4°C in the dark
Volume: 10ml
Operator: LG



	Name	Purity %	CAS	Ref.	Batch #	Required Concent.	Certified Concent.
1	PCB 052	99.0	35693-99-3	P013	Ab	10µg/ml ±0.55	9.92µg/ml
	Isooctane	99.9	540-84-1		I031		

Name : PCB 052 Formula: C ₁₂ H ₆ Cl ₄ Molecular Weight: 291.99 gmol ⁻¹ State: Liquid EINECS: NA NMR ¹H: HPLC-DAD-MS: GC-FID:	Safety Data (product) : Xn:Harmful N: Dangerous for the environment Hazard statements: H373-H410 Precautionary statements: P273-P501
	Safety Data (solvent) : F: Flammable Xi: Irritating Xn: Harmful N: Dangerous for the environment Hazard statements: H225-H304-H315-H336-H410 Precautionary statements: P210-P261-P273-P301+P310-P331-P501

A2S is a brand of Analytical Standard Solutions company distributed by	Certification Date May 12th 2015 Revision Date November 18th 2016	Signature Miss RAYMOND Q.C. Manager
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* For all details of uncertainty see below



The company A2S has been certified ISO 9001: 2008 for all its activities on August 20th, 2012 ref N°2012/51356.1.

GENERAL & QUALITY INFORMATION

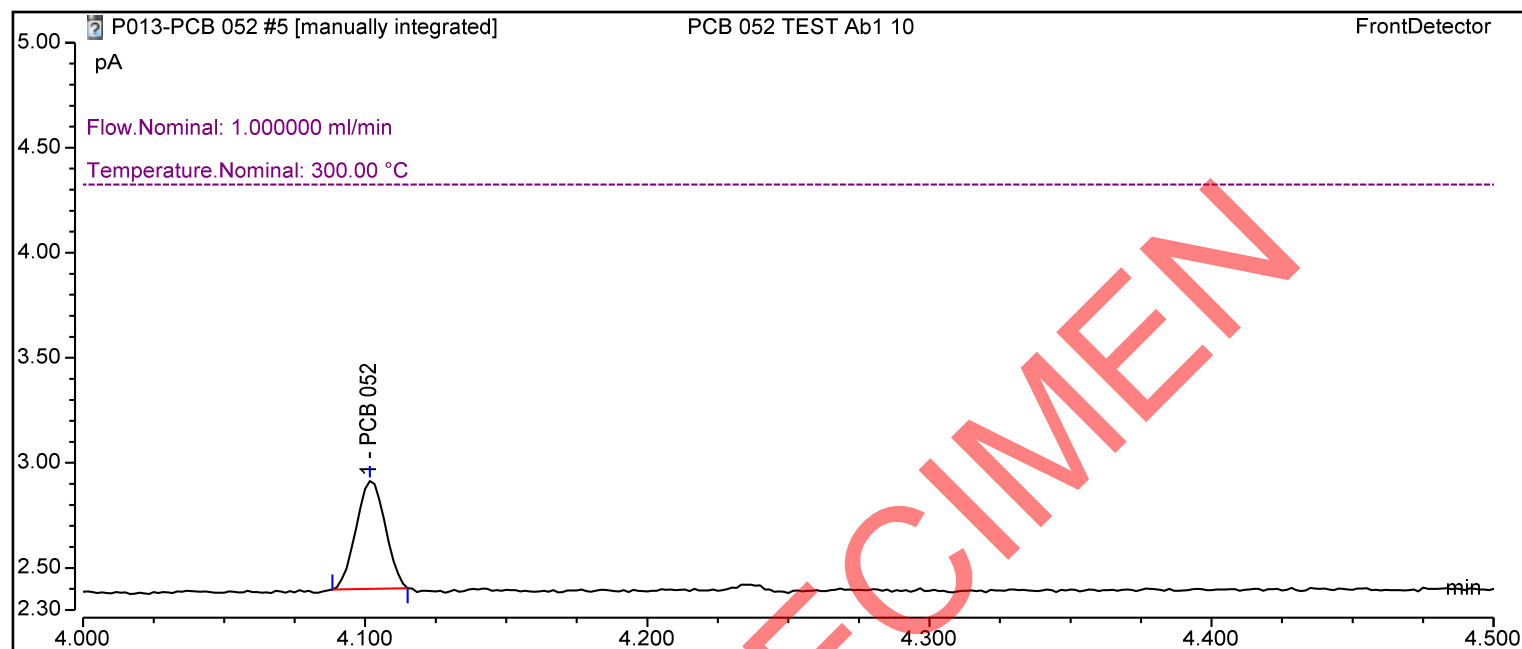
- 1- **General Information:** Analytical Standard Solutions – A2S is a producer of analytical organic standards in neat, pure in solution and mixture forms. A2S is located in France, 284, rue Blaise Pascal 33127 SAINT JEAN D'ILLAC.
- 2- **Quality Standards and Documentation:**

A2S is certified ISO 9001: 2008 Quality Management System – Requirements AFNOR Certification Number N°2012/51356.2.



The certificates of analysis are designed in accordance with ISO Guide 31 (Reference Materials – Contents of Certificates and labels) and ISO Guide 35 (Reference Materials - General and Statistical Principal for Certification).
- 3- **Intended Use:** The product covered by this certificate is designed for calibration or for use in quality control procedures for the specified chemical compound listed on the first page. This product can be used for quantification and/or identification. This product can also be used as a reference material to validate analytical procedures, subject to the conditions under Section 11. For neat products quantities sold are integrate in a range between the quantity request and 5% more. If dilution is required, use only Class A glassware and diluents compatible with all certified analytes in this preparation. All solutions should be thoroughly mixed prior to use.
- 4- **Raw Materials:** Reference standards are prepared from the highest quality starting materials with defined purities. All analytes and solvents are obtained from pre-qualified vendors and then analyzed or evaluated prior to use.
- 5- **Manufacturing:** All balances are calibrated daily using an in-house procedure with weights that are compared annually to master weights and traceable to NIST. The balances are also calibrated annually by an ISO/IEC 17025 accredited calibration laboratory. NIST Test number: EM14936. Class A glassware is used in the manufacture and quality control of all standards. Good Laboratory Practices have been used throughout the preparation of RM.
- 6- **Homogeneity Assessment:** Homogeneity of the finished product is assessed by analyzing sample batches or by other method consistent with the intended use of the product and by procedures that comply with the appropriate Quality System requirements, and ISO Guide 35 §7.
- 7- **Stability Assessment:** The manufacturer guarantees the stability of this solution through the expiration date stated on the label, when handled and store according to the conditions stated on the label. To ensure a uniform solution, mix the contents of the sealed container thoroughly prior to use. Care should be taken not to contaminate the contents of the original container.
- 8- **Analytical Quality Control:** Products are tested by validated analytical methods specified in the manufacturer's quality system.
- 9- **Uncertainty Statistics and Confidence Limits:** The uncertainty values as stated on the face of this certificate have been determined using the EURACHEM/CITAC Guide (Quantifying Uncertainty in Analytical Measurement) Ed.2. We have defined two type of uncertainties: First a "gravimetric" uncertainty named U_g evaluated both Type A (based on series of observations) and Type B (manufacturers specification and calibration data) factors and report a combined expanded uncertainty equal to the positive square root of the total variance of uncertainty of the components using the following formula: $U_g = \sqrt{u_{\text{pesée or } u_{\text{pipettes}}^2}$. Second, an "total" uncertainty named U_t report a combined expanded uncertainty equal to the positive square root of the total variance of gravimetric uncertainty and analyses uncertainty using the following formula: $u_{\text{total}} = \sqrt{u_{\text{pesée}}^2 + 2u_{\text{up}}^2 + u_{\text{ana}}^2 + Xu_{\text{p5000}}^2}$. The expanded uncertainty U , assumes a normal distribution and a coverage factor of $k=2$ is chosen using approximately a 95% confidence level. Laboratories accredited to ISO/IEC 17025 and ISO Guide 34 is required to estimate uncertainty budgets associated with the measurements they make. However, for analysis, the certified value should be used as actual value.
- 10- **Warranties:** The manufacturer warrants that its products shall conform to the description of such products as provided in its catalog or on the specific product label. This warranty is exclusive, and the manufacturer makes no other warranty, express or implied, including any implied warranty of merchantability of fitness for any particular purpose.
- 11- **Legal Notice and Limit of Liability:** This product is for routine laboratory analysis and research purposes only. Due to the hazardous nature, only trained personnel should handle this product. The company's liability will be limited to the replacement of the product or refund of purchase price. Notice of claims must be made within thirty (30) days from the date of delivery.

Analytical data



Chromatographic information:

GC-MS: ThermoFisher Scientific TRACE1300, FID
Column: TG-5MS 30m 0.25mm/0.25micron
Temp. ramp: 75 to 300 degrees at 75 degrees/min
Inlet 250 degrees Split 50ml/min
Fdetector 330 degrees

No.	Ret.Time min	Peak Name	Lot Customer	Internal Average
			Area mAU*min	Area mAU*min
1	4.10	PCB 052	0.006	0.0063
			9.92µg/ml	10µg/ml

Sequence:P013-PCB 052
22/11/2016 10:09 AM