



BDG SYNTHESIS

Certificate of Analysis

BDG Synthesis certifies that this reference material meets or exceeds the specifications stated herein.

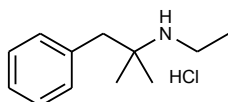
Barry Dent

Barry R. Dent, PhD, Director
7 November 2012

Name: *N*-Ethylphentermine HCl

CAS Number: 5531-43-1 (free base)

Structure:



Molecular Weight: $C_{12}H_{19}N \cdot HCl = 213.75$

Lot Number: BDG 14170.2

Appearance: White, crystalline solid

Corrected Purity: 99.1 % (HPLC) - 0.5 % (acetone) - 2.9 % (water) = 95.7 %

Re-test Date: 7 November 2013

Storage and Handling:

Temperature:	refrigerate for prolonged storage; may be handled and shipped at ambient temperature.
Humidity:	may be hygroscopic; store desiccated; recommended to determine water content periodically.
Light:	protect from strong sunlight.
Caution:	only experienced laboratory personnel should handle the material.

Identity and Purity

Proton NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available.

Residual Solvents: a small amount of acetone (0.5 % w/w) is observed.

Impurities: no significant impurities are evident in the spectrum.

Carbon-13 NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available.

High-resolution Mass Spectrum (TOF MS ES+)

Found m/z 178.1595. $C_{12}H_{20}N$ $[M+H]^+$ (free base) requires m/z 178.1596. The deviation of 0.6 ppm is within normally accepted limits for the establishment of identity by HRMS.

HPLC

A sharp, symmetrical peak is observed (99.1 %). Note: in the absence of reference materials for preparing calibration curves, it is assumed that all peaks have the same detector response. Where possible, the conditions of analysis follow a pharmacopeial or literature method, or have been adapted from same.

Elemental Analysis

	Found:	C 65.98, H 9.68, Cl 16.42, N 6.44 %
$C_{12}H_{19}N \cdot HCl \cdot 0.3H_2O$	Requires:	C 65.77, H 9.47, Cl 16.18, N 6.39 %
$C_{12}H_{19}N \cdot HCl$	Requires:	C 67.43, H 9.43, Cl 16.59, N 6.55 %

The elemental analyses fall somewhat outside those expected for anhydrous material; the presence of water is reasonably expected from the method of purification and/or the type of material, and the "best-fit" hydrated molecular formula is given.

Karl-Fischer Analysis

	Found:	H_2O 2.9 %
$C_{12}H_{19}N \cdot HCl \cdot 0.3H_2O$	Requires:	H_2O 2.5 %

Of necessity, only a small sample could be used and only a single or duplicate analysis performed. We are unable to state what the errors in the reported water content are, but recommend that the result be used, as the best available, when determining corrected purity.

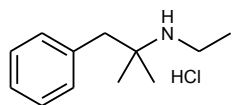
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials often contain higher levels of residual solvents and/or water, and we urge you to use the corrected purity where needed rather than the raw HPLC purity. This compound is intended for use as an analytical reference material and it is not for human administration. Structures are shown with relative stereochemistry unless otherwise specified.

The re-test date is assigned from experience gained with the material in the laboratory and/or on storage. It is not possible to perform formal storage studies because of the small amount of material available.

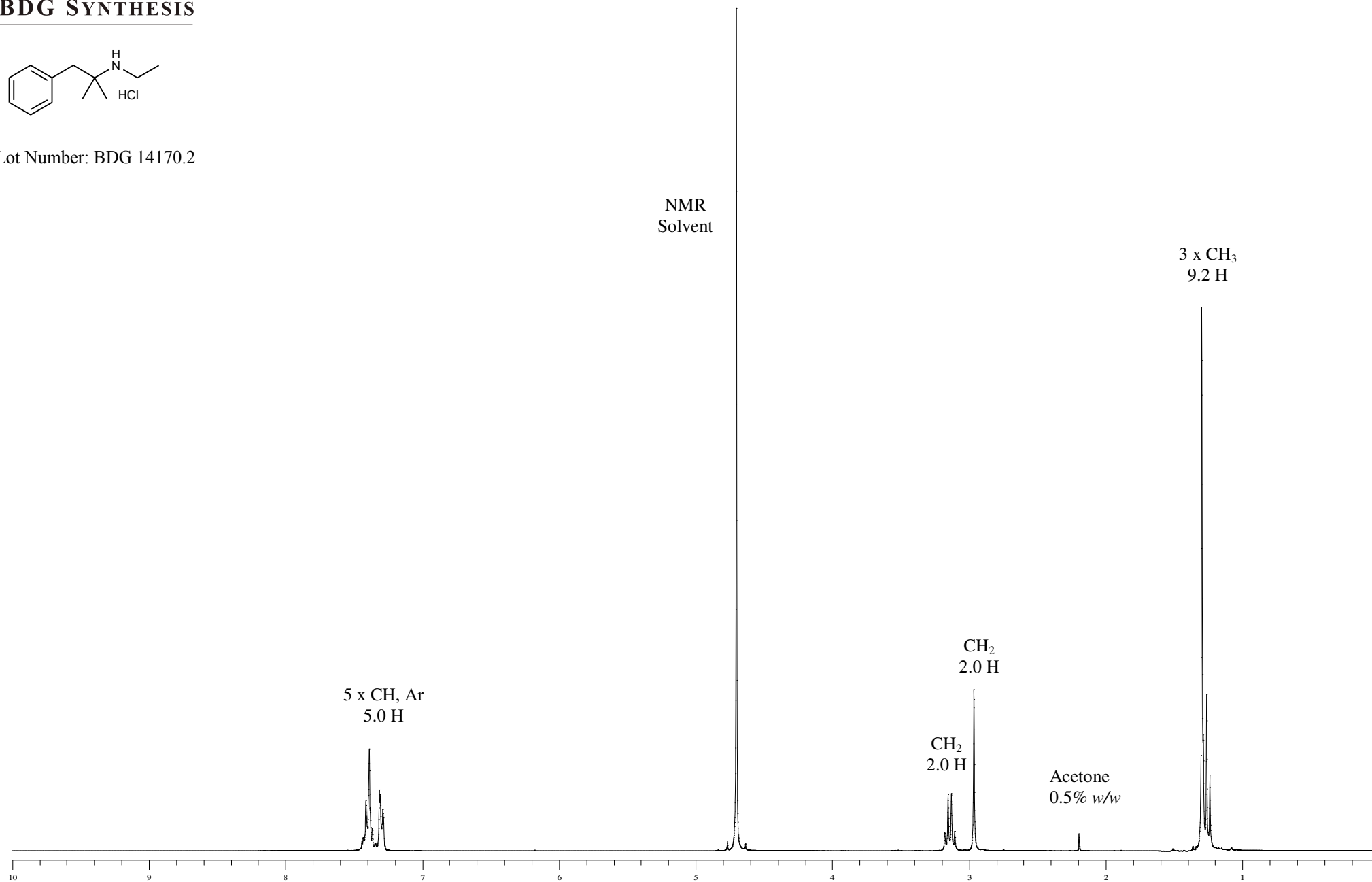


Proton NMR Spectrum of *N*-Ethylphentermine HCl in D₂O

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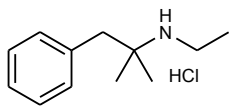
Lot Number: BDG 14170.2



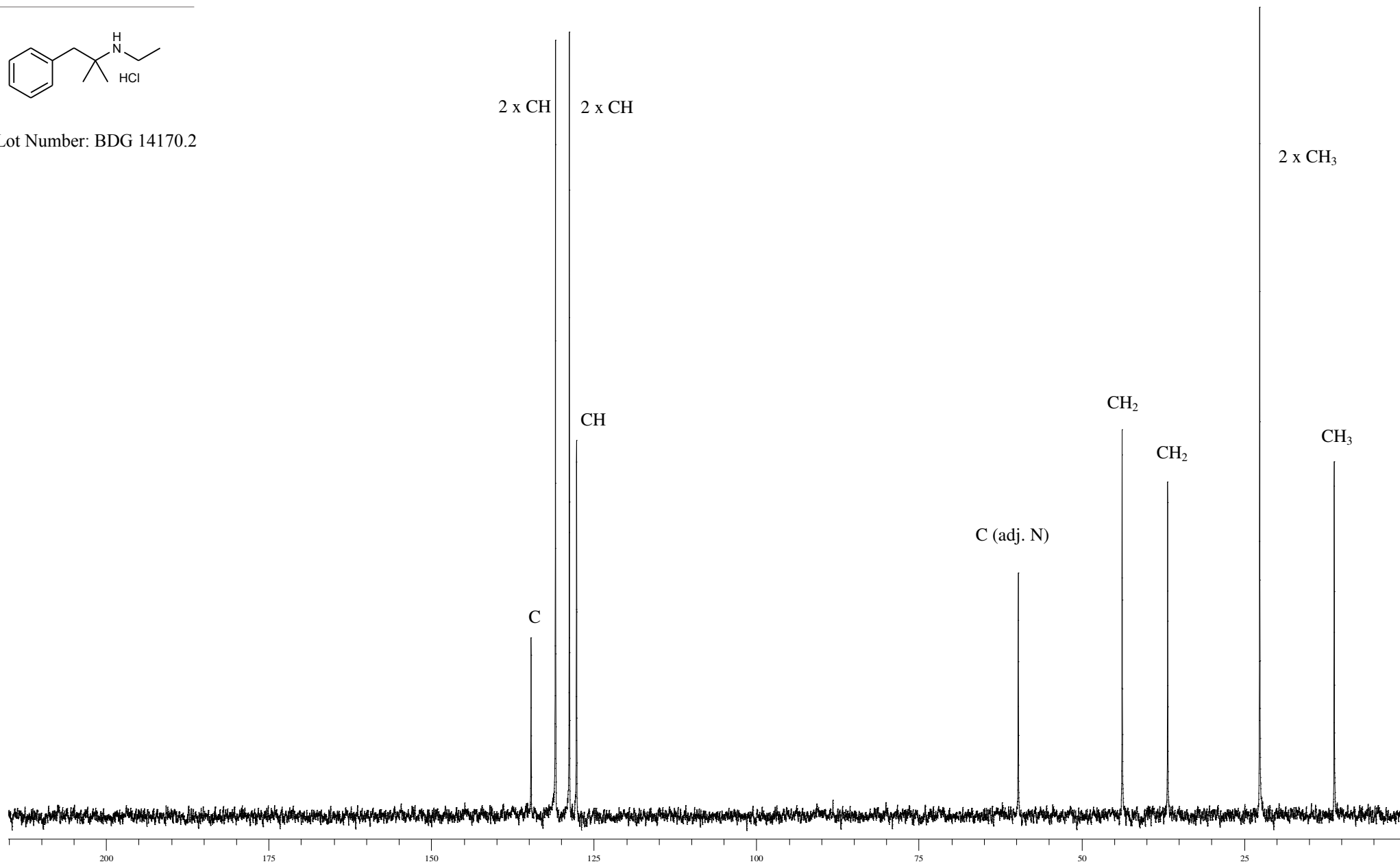


Carbon-13 NMR Spectrum of *N*-Ethylphentermine HCl in D₂O

BDG SYNTHESIS



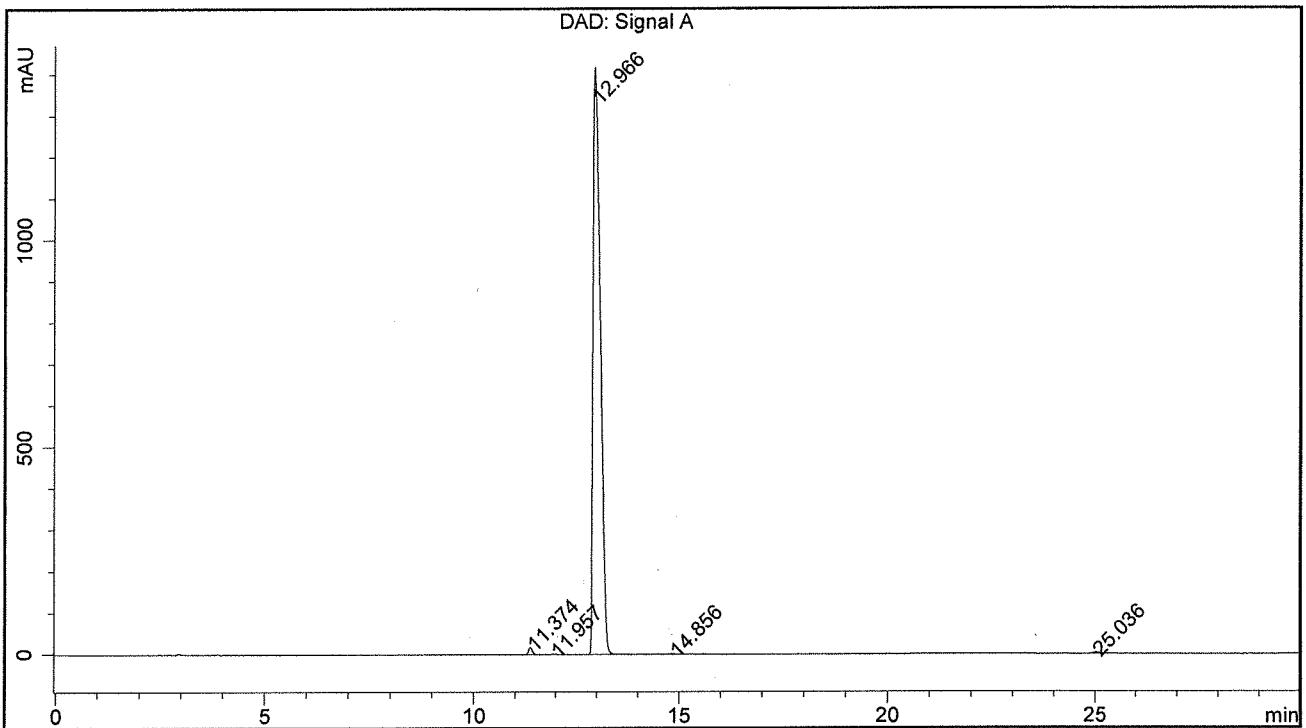
Lot Number: BDG 14170.2



BDG - Analysis of N-Ethylphentermine HCl

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
 Mobile Phase A: 90:10 50 mM Potassium diHydrogen Phosphate pH 3.0 : Acetonitrile
 Mobile Phase B: 60:40 50 mM Potassium diHydrogen Phosphate pH=3.0 : Acetonitrile
 Gradient (A:B) : T0=90:10, T20=60:40, T24=60:40, T26=90:10, T30=90:10
 Flow Rate : 1.0 mL/min
 Sample Solvent : Initial Mobile Phase
 Injection Volume : 10 uL
 Column Temperature : 20C
 Detection : UV at 215 nm

Sample Name	BDG 14170.2	Instrument	AnalyticalLC01
Acquisition	07/11/2012, 15:22:09	Method (rev.)	LC10542a (8)
Sequence	BDG_07Nov2012c - Reprocessed	Vial Position	1
Operator	solvation010\cerityadmin	Injection	1 of 1



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	11.37 min	16.9380	107.6048	0.0981 min	0.609 %
2	11.96 min	1.0466	7.6247	0.1090 min	0.043 %
3	12.97 min	1418.4520	17520.2844	0.2041 min	99.095 %
4	14.86 min	1.0981	8.4226	0.1135 min	0.048 %
5	25.04 min	2.9948	36.3962	0.1898 min	0.206 %