



## BDG SYNTHESIS

### Certificate of Analysis

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

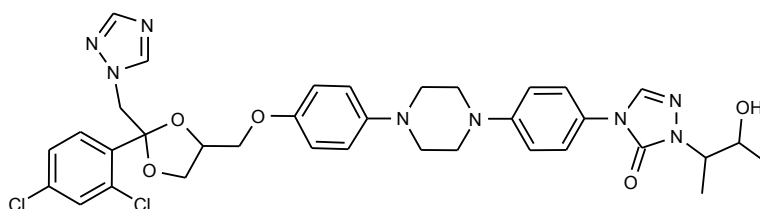
*Barry Dent*

Barry R. Dent, PhD, Director  
23 July 2011

**Name:** Hydroxyitraconazole

**CAS Number:** 112559-91-8

**Structure:**



**Molecular Weight:**  $C_{35}H_{38}Cl_2N_8O_5 = 721.63$

**Lot Number:** BDG 11260.1

**Appearance:** White powder

**Purity By HPLC:** 99.4 %

**Re-test Date:** 23 July 2012

**Storage and Handling:**

|              |  |
|--------------|--|
| Temperature: | refrigerate for prolonged storage; may be handled and shipped at ambient temperature.                    |
| Humidity:    | not believed to be hygroscopic; may be handled in normal laboratory atmosphere.                          |
| Light:       | store in an amber vial and protect from bright light.  |
| Caution:     | only experienced laboratory personnel should handle the material. The material is susceptible to static. |

## Identity and Purity

### Proton NMR Spectrum

Identity: The signals are consistent with the proposed structure and in accord with literature where available. The complexity of the spectrum indicates the presence of more than one conformer in solution.

Residual Solvents: no residual solvents are 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. The complexity of the spectrum indicates the presence of more than one conformer in solution.

### High-resolution Mass Spectrum (TOF MS ES+)

Found  $m/z$  721.2418.  $C_{35}H_{39}^{35}Cl_2N_8O_5$   $[M+H]^+$  requires  $m/z$  721.2420. The deviation of 0.3 ppm is within normally accepted limits for the establishment of identity by HRMS.

### HPLC

A sharp, symmetrical peak is observed (99.4 %). 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

|                          |           |                            |
|--------------------------|-----------|----------------------------|
| $C_{35}H_{38}Cl_2N_8O_5$ | Found:    | C 58.28, H 5.39, N 15.59 % |
|                          | Requires: | C 58.25, H 5.31, N 15.53 % |

The elemental analyses fall within generally accepted limits for establishing the molecular formula given. The results may also be taken to imply the absence of significant quantities of water or inorganic salts (which have not been elsewhere tested for because of sample size limitations).

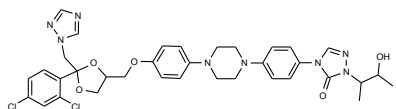
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials 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.

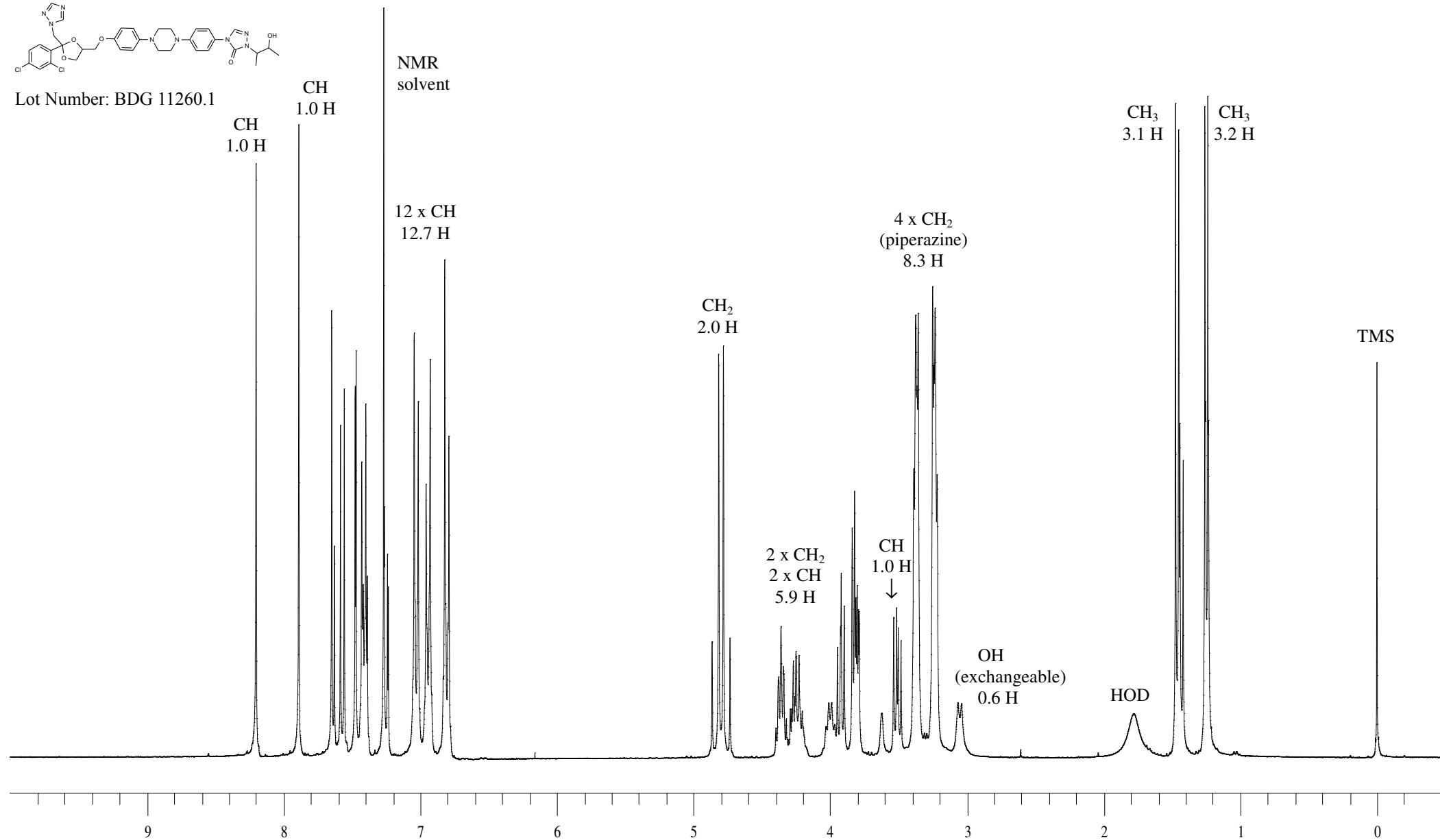


Proton NMR Spectrum of Hydroxyitraconazole in CDCl<sub>3</sub>

**BDG SYNTHESIS**



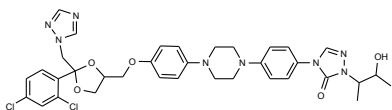
Lot Number: BDG 11260.1



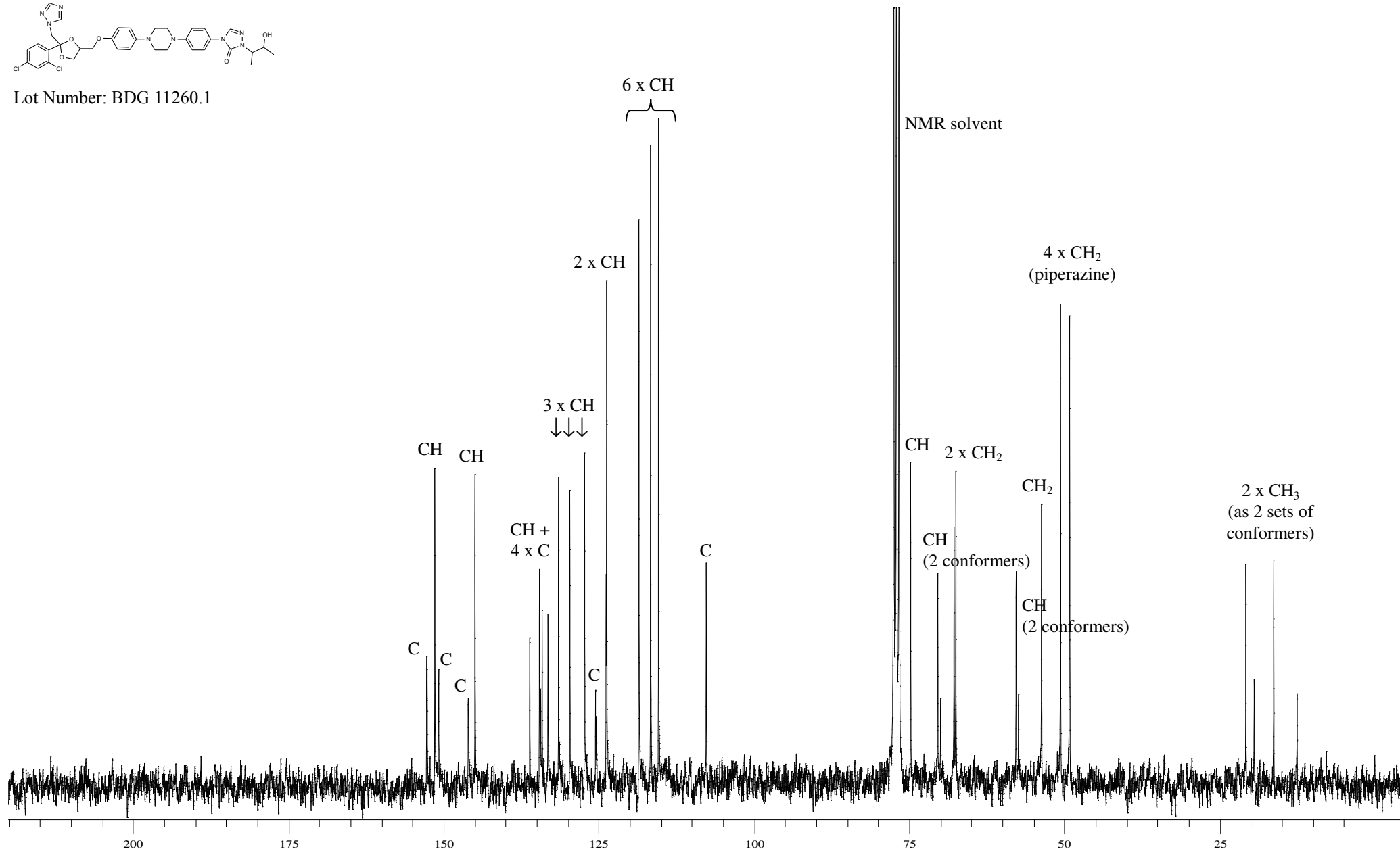


# Carbon-13 NMR Spectrum of Hydroxyitraconazole in CDCl<sub>3</sub>

**BDG SYNTHESIS**



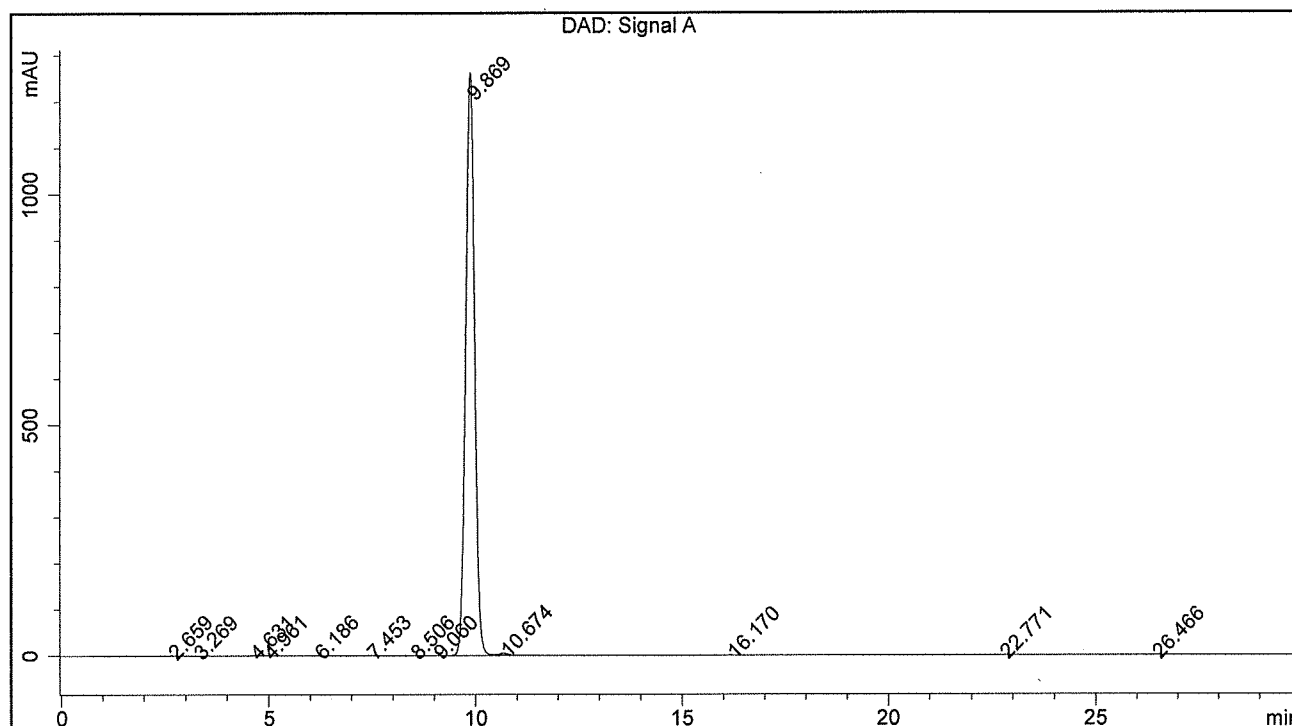
Lot Number: BDG 11260.1



BDG - Analysis of Hydroxyitraconazole

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm  
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm  
 Mobile Phase : 45:55 20mM Potassium Dihydrogen Phosphate pH=3.0 : Acetonitrile  
 Flow Rate : 1.0 mL/min  
 Sample Solvent : Mobile Phase  
 Column Temperature : 20C  
 Injection Volume : 10 uL  
 Detection : UV at 260 nm

|             |                              |               |                |
|-------------|------------------------------|---------------|----------------|
| Sample Name | BDG 11260.1                  | Instrument    | AnalyticalLC01 |
| Acquisition | 23/07/2011, 11:39:16         | Method (rev.) | LC10168a ( 10) |
| Sequence    | BDG_23Jul2011b - Reprocessed | Vial Position | 1              |
| Operator    | solvation010\cerityadmin     | Injection     | 1 of 1         |



Area Percent Report

| Peak# | RT        | Peak Height | Peak Area  | Width      | Area %   |
|-------|-----------|-------------|------------|------------|----------|
| 1     | 2.66 min  | 0.5111      | 2.5295     | 0.0757 min | 0.013 %  |
| 2     | 3.27 min  | 0.1320      | 0.7532     | 0.0926 min | 0.004 %  |
| 3     | 4.63 min  | 0.1157      | 1.0511     | 0.1180 min | 0.006 %  |
| 4     | 4.96 min  | 0.4846      | 5.4095     | 0.1582 min | 0.028 %  |
| 5     | 6.19 min  | 0.9949      | 10.3409    | 0.1553 min | 0.054 %  |
| 6     | 7.45 min  | 1.0673      | 11.8939    | 0.1780 min | 0.062 %  |
| 7     | 8.51 min  | 0.2216      | 2.7018     | 0.1663 min | 0.014 %  |
| 8     | 9.06 min  | 0.2613      | 3.0673     | 0.1589 min | 0.016 %  |
| 9     | 9.87 min  | 1263.2455   | 18925.8774 | 0.2328 min | 99.404 % |
| 10    | 10.67 min | 3.6318      | 50.0528    | 0.2128 min | 0.263 %  |
| 11    | 16.17 min | 0.4186      | 8.9238     | 0.2687 min | 0.047 %  |
| 12    | 22.77 min | 0.3574      | 10.1994    | 0.3469 min | 0.054 %  |
| 13    | 26.47 min | 0.1805      | 6.6219     | 0.4400 min | 0.035 %  |