

## BDG SYNTHESIS

### Certificate of Analysis

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

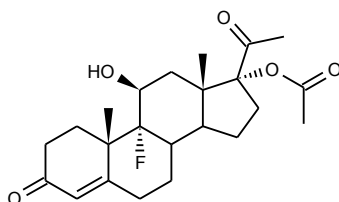
*Barry Dent*

Barry R. Dent, PhD, Director  
17 February 2011

**Name:** Flugestone Acetate

**CAS Number:** 2529-45-5

**Structure:**



**Molecular Weight:**  $C_{23}H_{31}FO_5 = 406.49$

**Lot Number:** BDG 1387

**Appearance:** White, crystalline solid

**Purity By HPLC:** 99.4 %

**Re-test Date:** 17 February 2016

**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:	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: 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.

### High-resolution Mass Spectrum (ESI+)

Found  $m/z$  429.2048.  $C_{23}H_{31}FNaO_5$   $[M+Na]^+$  requires  $m/z$  429.2048. The deviation of 0.1 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

	Found:	C 67.80, H 7.88 %
$C_{23}H_{31}FO_5$	Requires:	C 67.96, H 7.69 %

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).

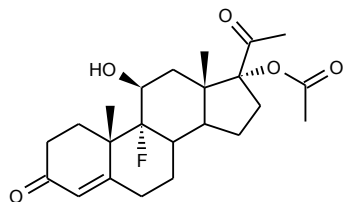
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials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



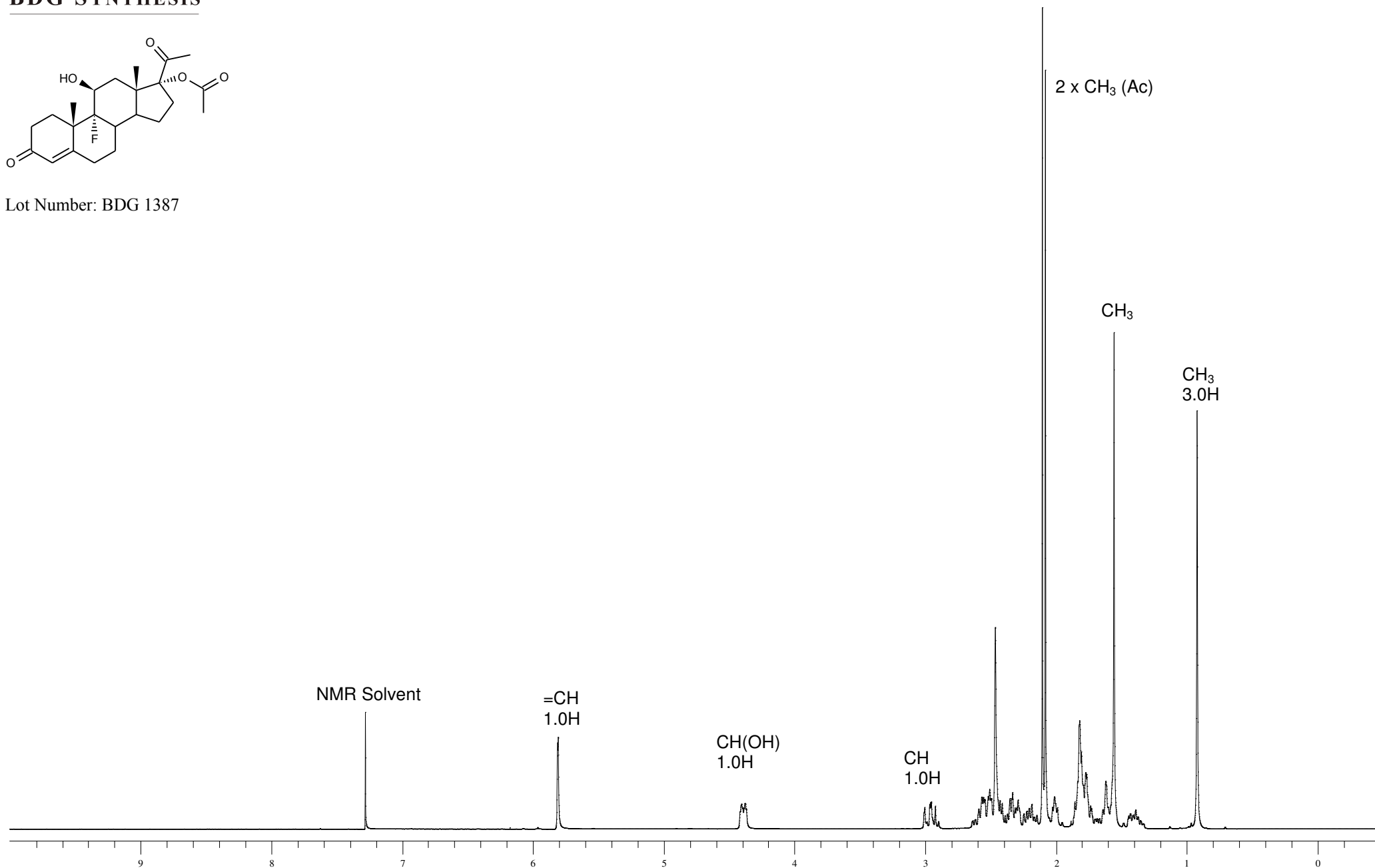
Proton NMR Spectrum of Flugestone Acetate in CDCl<sub>3</sub>

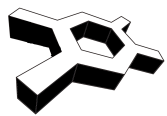
**BDG SYNTHESIS**



Lot Number: BDG 1387

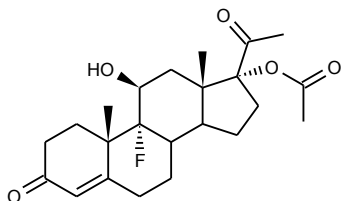
3 x CH<sub>3</sub> + 7 x CH<sub>2</sub> + CH + HOD  
27.6H



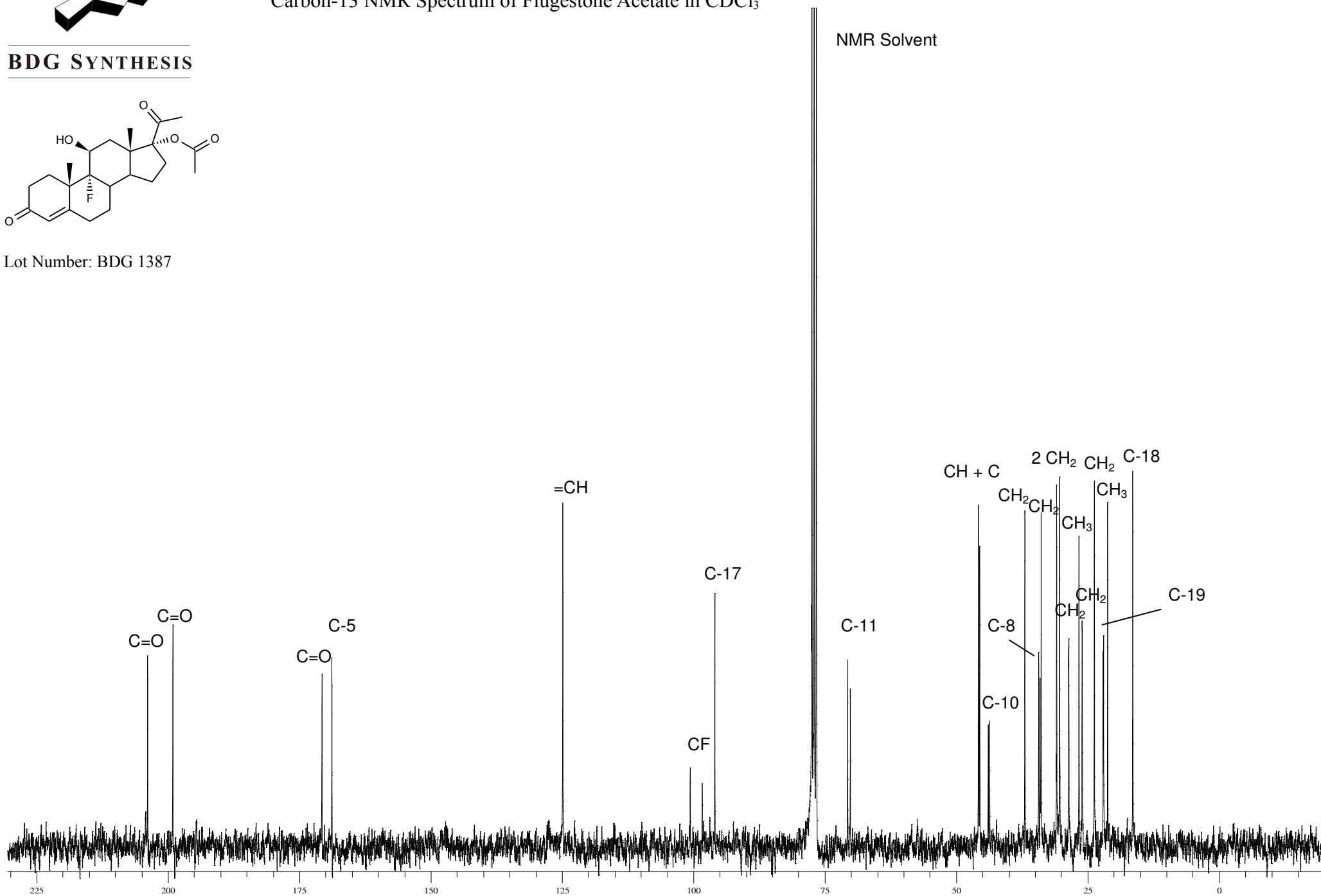


**BDG SYNTHESIS**

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



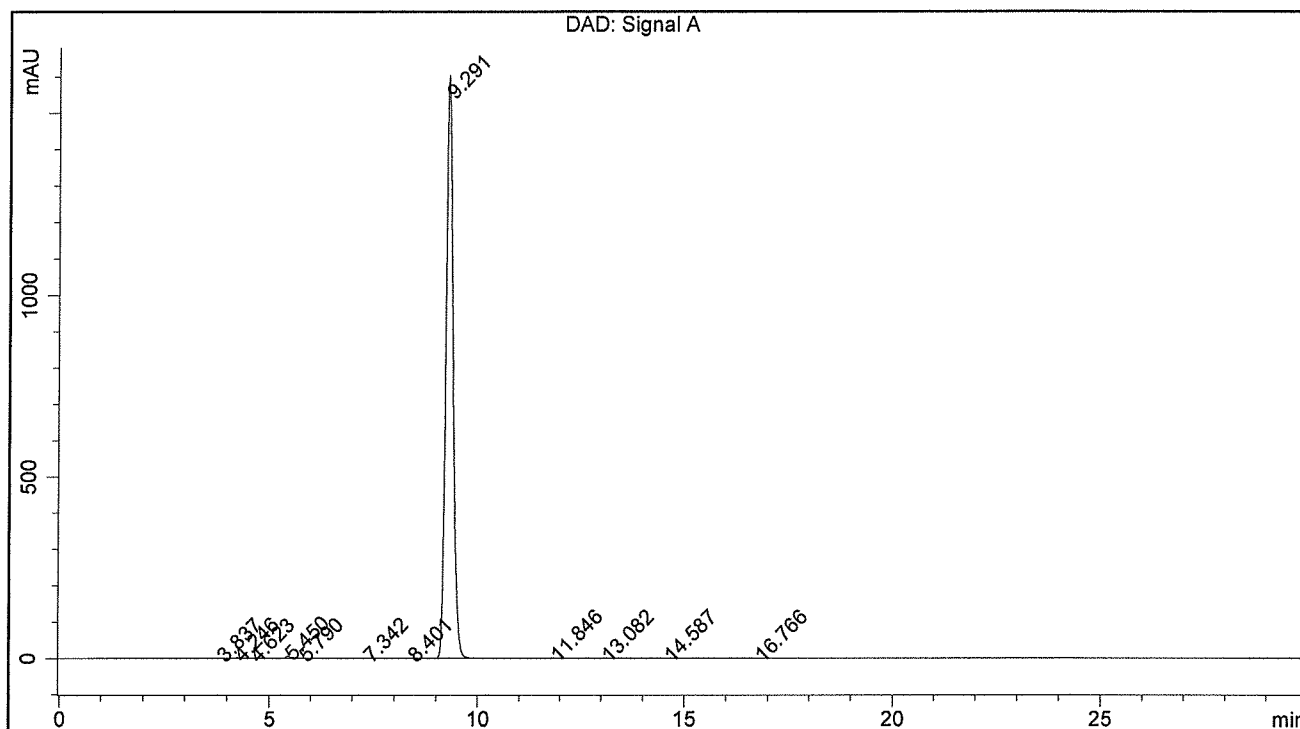
Lot Number: BDG 1387



BDG - Analysis of Flugestone Acetate

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm  
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm  
 Mobile Phase : 50:50 Water : Acetonitrile  
 Flow Rate : 1.0 mL/min  
 Sample Solvent : Mobile Phase  
 Injection Volume : 10 uL  
 Column Temperature : 20C  
 Detection : UV at 242 nm

Sample Name	BDG 1387	Instrument	AnalyticalLC01
Acquisition	17/02/2011, 12:41:35	Method (rev.)	LC10428a ( 6)
Sequence	BDG_17Feb2011c - Reprocessed	Vial Position	1
Operator	solvation010\cerityadmin	Injection	2 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	3.84 min	0.3900	2.7279	0.1036 min	0.014 %
2	4.25 min	1.7611	11.0499	0.0972 min	0.057 %
3	4.62 min	0.3275	2.7504	0.1260 min	0.014 %
4	5.45 min	5.9706	47.5221	0.1209 min	0.244 %
5	5.79 min	1.0503	9.4830	0.1333 min	0.049 %
6	7.34 min	1.5819	17.3561	0.1620 min	0.089 %
7	8.40 min	0.4549	5.9566	0.1828 min	0.031 %
8	9.29 min	1601.0152	19365.2075	0.1871 min	99.391 %
9	11.85 min	0.7100	8.2754	0.1860 min	0.042 %
10	13.08 min	0.1768	3.0069	0.2264 min	0.015 %
11	14.59 min	0.2603	5.0085	0.2704 min	0.026 %
12	16.77 min	0.2575	5.5225	0.2902 min	0.028 %