



## BDG SYNTHESIS

### Certificate of Analysis

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

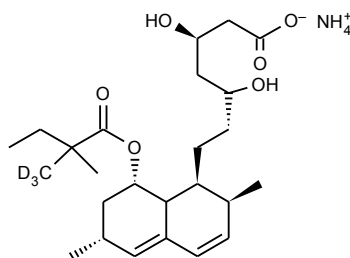
*Barry Dent*

Barry R. Dent, PhD, Director  
16 May 2010

**Name:** Simvastatin Acid-d<sub>3</sub> Ammonium Salt

**CAS Number:** 139893-43-9 (unlabelled)

**Structure:**



**Molecular Weight:** C<sub>25</sub>H<sub>36</sub>D<sub>3</sub>O<sub>6</sub>·NH<sub>4</sub> = 456.63

**Lot Number:** BDG 10749.3

**Appearance:** White powder

**Purity By HPLC:** 98.8 %

**Isotopic Purity:** Under 0.5 % d<sub>0</sub>

**Re-test Date:** 16 May 2015

**Storage and Handling:**

Temperature:	ambient laboratory temperature; may be refrigerated.
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.

Isotopic Labelling: signals at the site of deuteration are greatly diminished, compared with the spectrum of unlabelled material, indicating clean deuteration.

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.

Isotopic Labelling: signals at the site of deuteration have collapsed to small multiplets compared with the spectrum of unlabelled material, indicating clean deuteration.

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

Found  $m/z$  462.2912.  $C_{25}H_{37}D_3NaO_6$   $[M+Na]^+$  requires  $m/z$  462.2905. The deviation of 1.5 ppm is within normally accepted limits for the establishment of identity by HRMS. No signal for  $d_0$  material was seen (detection limit about 0.5 %).

### HPLC

A sharp, symmetrical peak is observed (98.8 %). 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 65.72, H 9.01, D 1.35, N 3.03 %
$C_{25}H_{36}D_3O_6 \cdot NH_4$	Requires:	C 65.76, H 8.83, D 1.32, N 3.07 %

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).

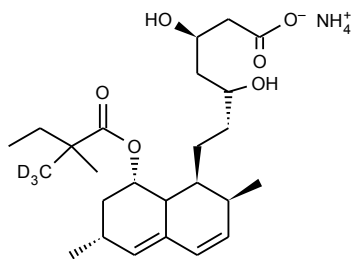
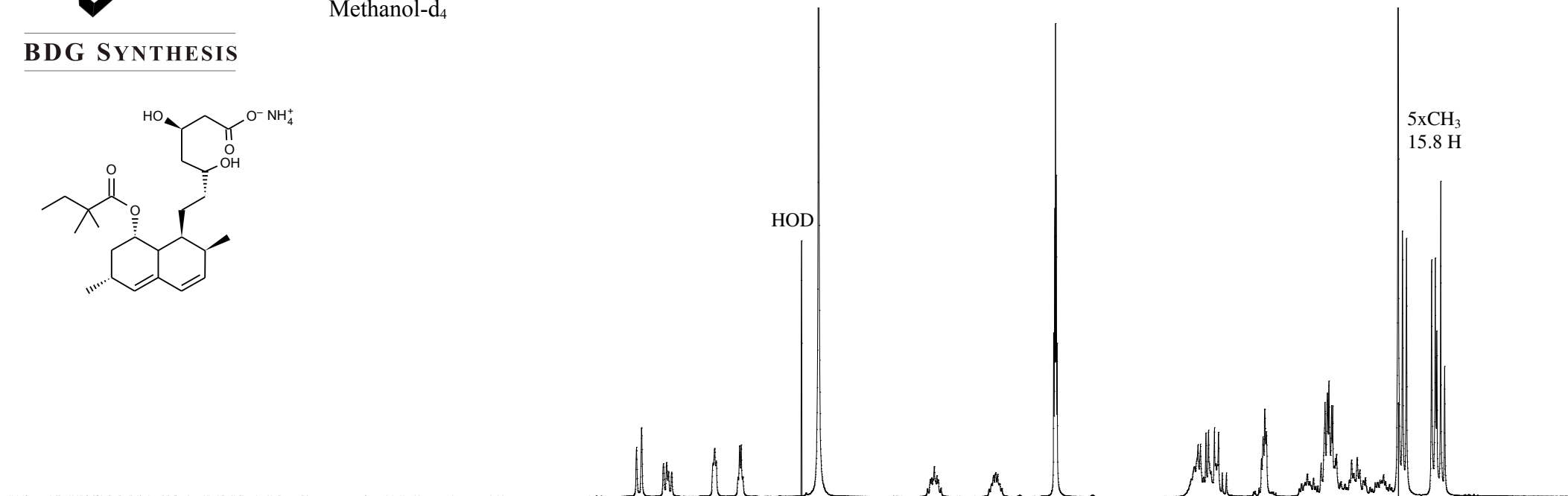
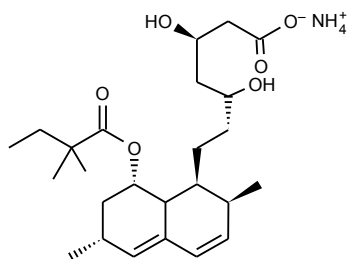
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials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

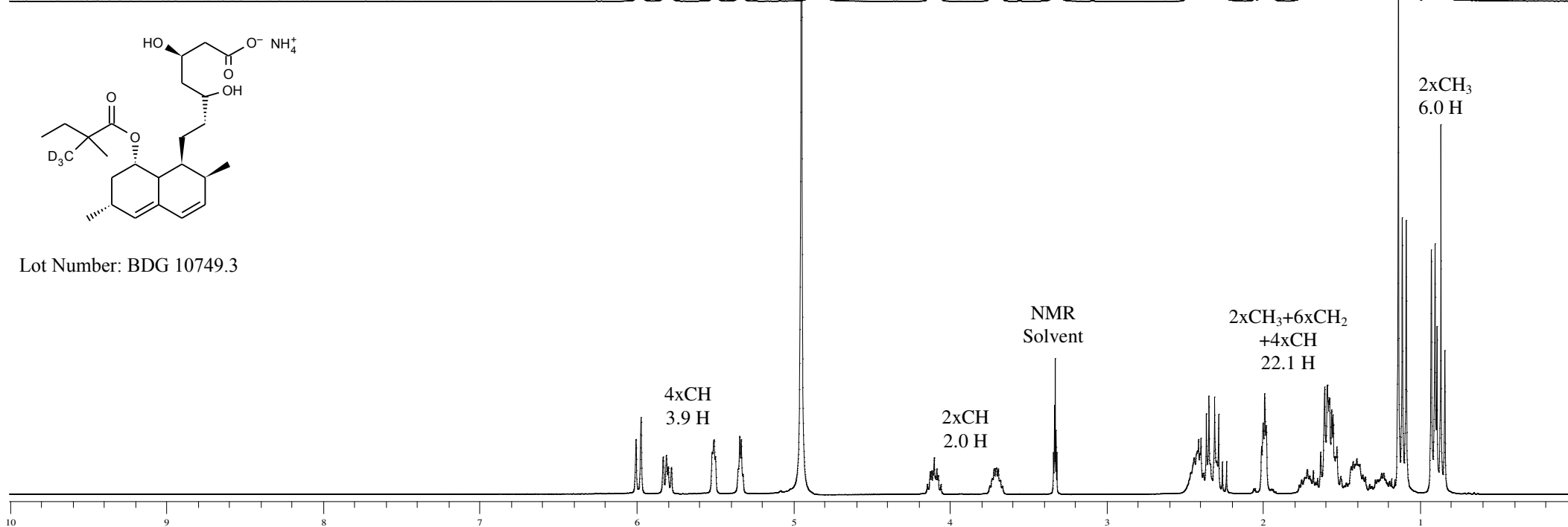


**BDG SYNTHESIS**

Proton NMR Spectrum of Simvastatin Acid Ammonium Salt (top) and Simvastatin Acid-d<sub>3</sub> Ammonium Salt (bottom) in Methanol-d<sub>4</sub>



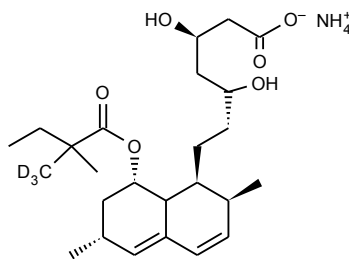
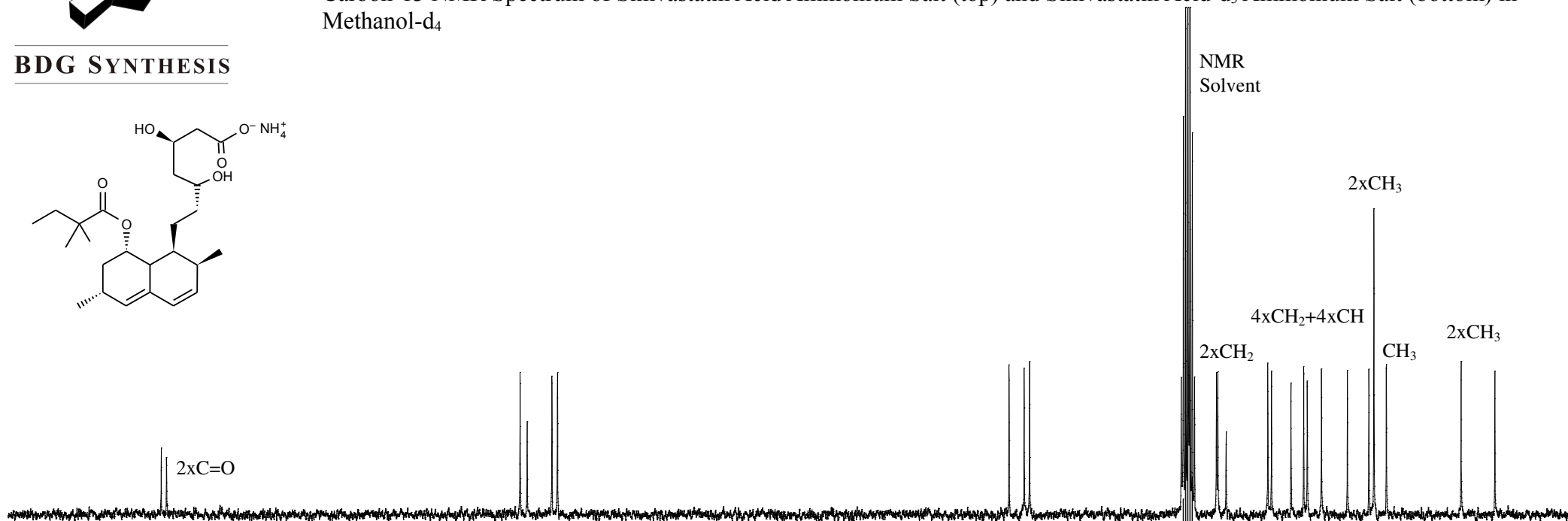
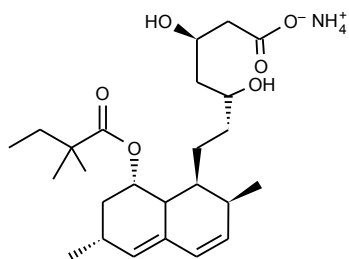
Lot Number: BDG 10749.3



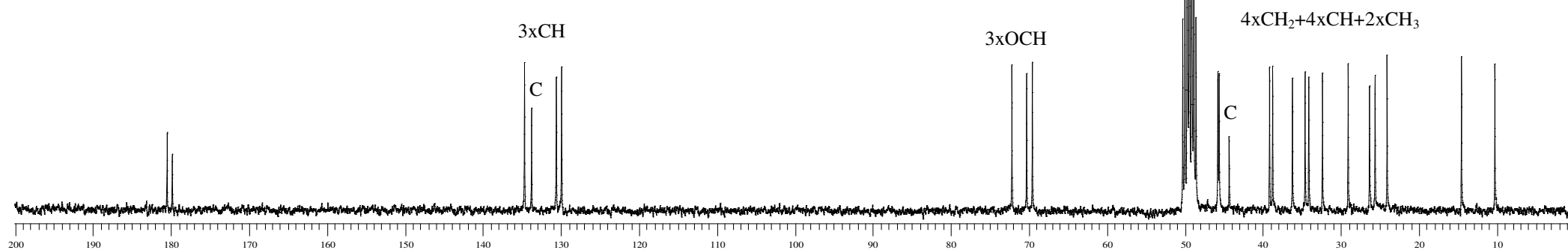


Carbon-13 NMR Spectrum of Simvastatin Acid Ammonium Salt (top) and Simvastatin Acid-d<sub>3</sub> Ammonium Salt (bottom) in Methanol-d<sub>4</sub>

**BDG SYNTHESIS**



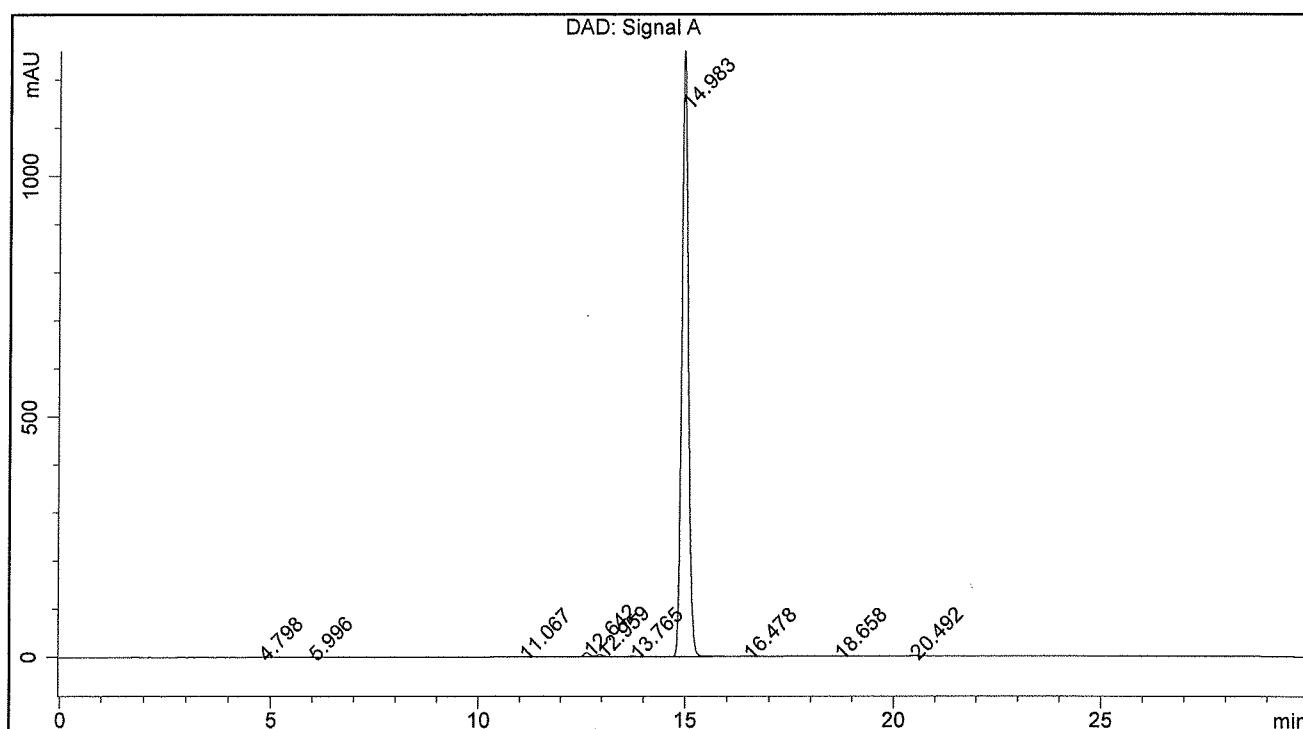
Lot Number: BDG 10749.3



BDG - Analysis of Simvastatin Acid-d3 Ammonium Salt

Column : Phenomenex Luna C18 5um 250 x 4.6 mm  
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm  
 Mobile Phase A : 50:50 10 mM Potassium diHydrogen Phosphate pH=4.0 : Acetonitrile  
 Mobile Phase B : 25:75 10 mM Potassium diHydrogen Phosphate pH=4.0 : Acetonitrile  
 Gradient : T0=100:0, T15=0:100, T25=0:100, T27=100:0, T30=100:0  
 Flow Rate : 1.0 mL/min  
 Column Temperature : 20C  
 Sample Solvent : 40:60 10 mM KH2PO4 pH=4.0 : Acetonitrile  
 Run time : 30 mins  
 Detection : UV 238nm

<b>Sample Name</b>	10749.3	<b>Instrument</b>	AnalyticalLC01
<b>Acquisition</b>	16/05/2010, 18:17:31	<b>Method (rev.)</b>	LC10170d ( 3)
<b>Sequence</b>	BDG_16May2010a	<b>Vial Position</b>	1
<b>Operator</b>	solvation010\cerityadmin	<b>Injection</b>	1 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	4.80 min	0.5548	3.8724	0.1054 min	0.028 %
2	6.00 min	0.7612	6.5133	0.1318 min	0.047 %
3	11.07 min	0.3692	3.3504	0.1339 min	0.024 %
4	12.64 min	7.9655	78.3790	0.1508 min	0.561 %
5	12.96 min	4.3678	44.3731	0.1545 min	0.318 %
6	13.76 min	1.2244	12.5993	0.1561 min	0.090 %
7	14.98 min	1263.9450	13789.6019	0.1673 min	98.762 %
8	16.48 min	0.7007	8.1103	0.1810 min	0.058 %
9	18.66 min	0.4274	6.9139	0.2347 min	0.050 %
10	20.49 min	0.6375	8.7897	0.2109 min	0.063 %