



BDG SYNTHESIS

Certificate of Analysis

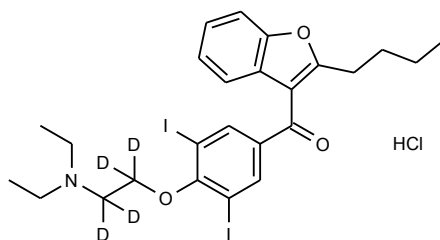
BDG Synthesis certifies that this reference material meets or exceeds the specifications stated herein.

Neil Beare

Neil Beare, PhD, Director
10 October 2016

Name: Amiodarone-d₄ HCl
CAS Number: 19774-82-4 (unlabelled)

Structure:



Molecular Weight: C₂₅H₂₅D₄I₂NO₃·HCl = 685.80
Lot Number: BDG 12433.4
Appearance: White, crystalline solid
Corrected Purity: 99.4 % (HPLC) - 1.0 % (acetone) = 98.4 %
Isotopic Purity: Under 0.5 % d₀
Re-test Date: 10 October 2021
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.

Isotopic Labelling: signals at the sites of deuteration are greatly diminished, compared with what would be expected for unlabelled material, indicating clean deuteration.

Residual Solvents: a small amount of acetone (1.0 % 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.

Isotopic Labelling: signals at the sites of deuteration have collapsed to small multiplets compared with what would be expected for unlabelled material, indicating clean deuteration.

High-resolution Mass Spectrum (ESI+)

Found m/z 650.0572. $C_{25}H_{26}D_4I_2NO_3$ $[M+H]^+$ requires m/z 650.0566. The deviation of 0.9 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 somewhat broadened, tailing 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 43.98, H 3.87, D 1.19, N 2.02 %
$C_{25}H_{25}D_4I_2NO_3 \cdot HCl$	Requires:	C 43.78, H 3.82, D 1.17, N 2.04 %

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).

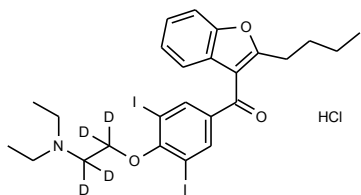
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials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

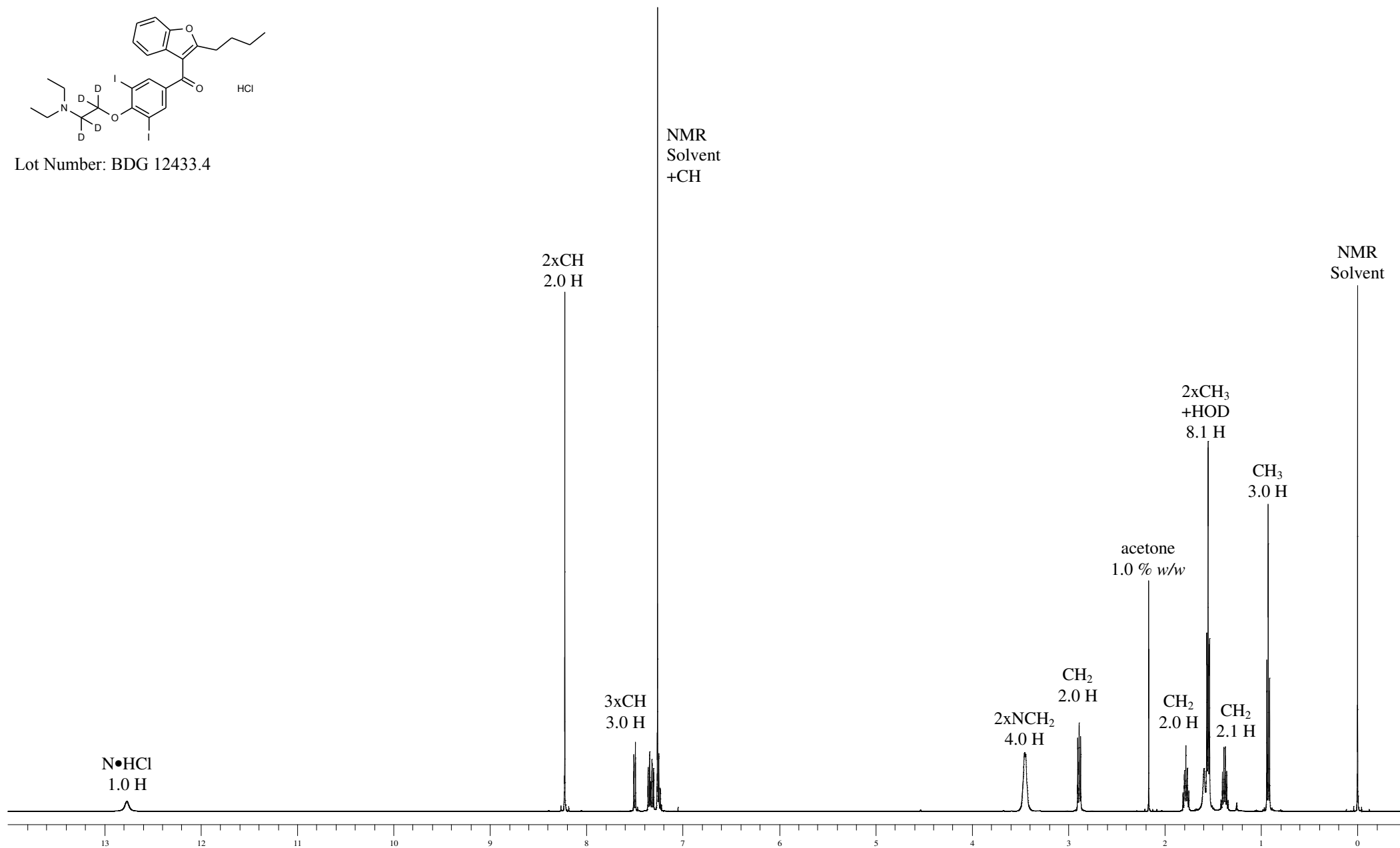


Proton NMR Spectrum of Amiodarone-d₄ HCl in CDCl₃

BDG SYNTHESIS



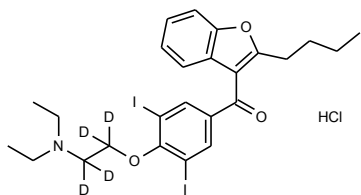
Lot Number: BDG 12433.4



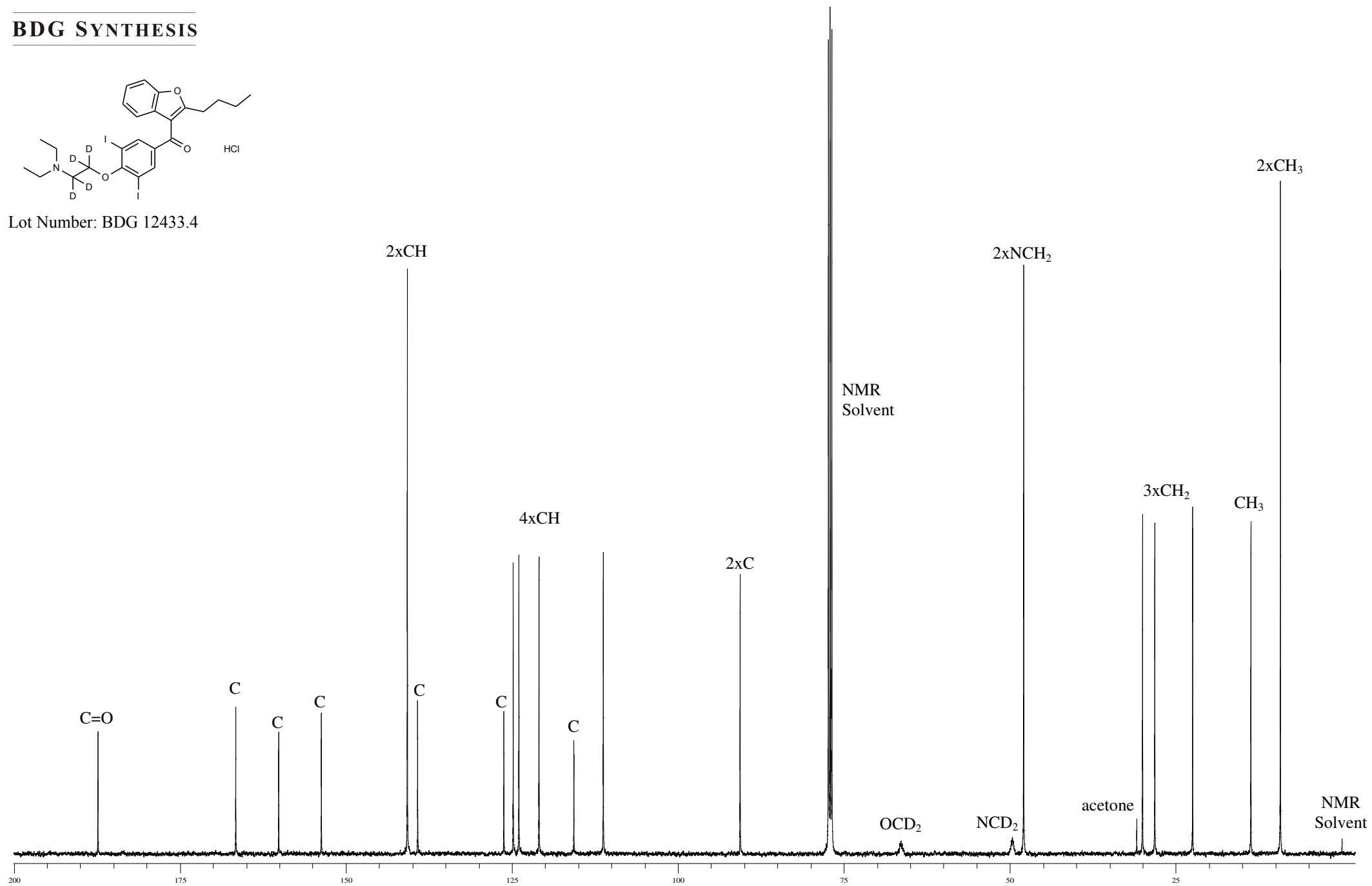


Carbon-13 NMR Spectrum of Amiodarone-d₄ HCl in CDCl₃

BDG SYNTHESIS



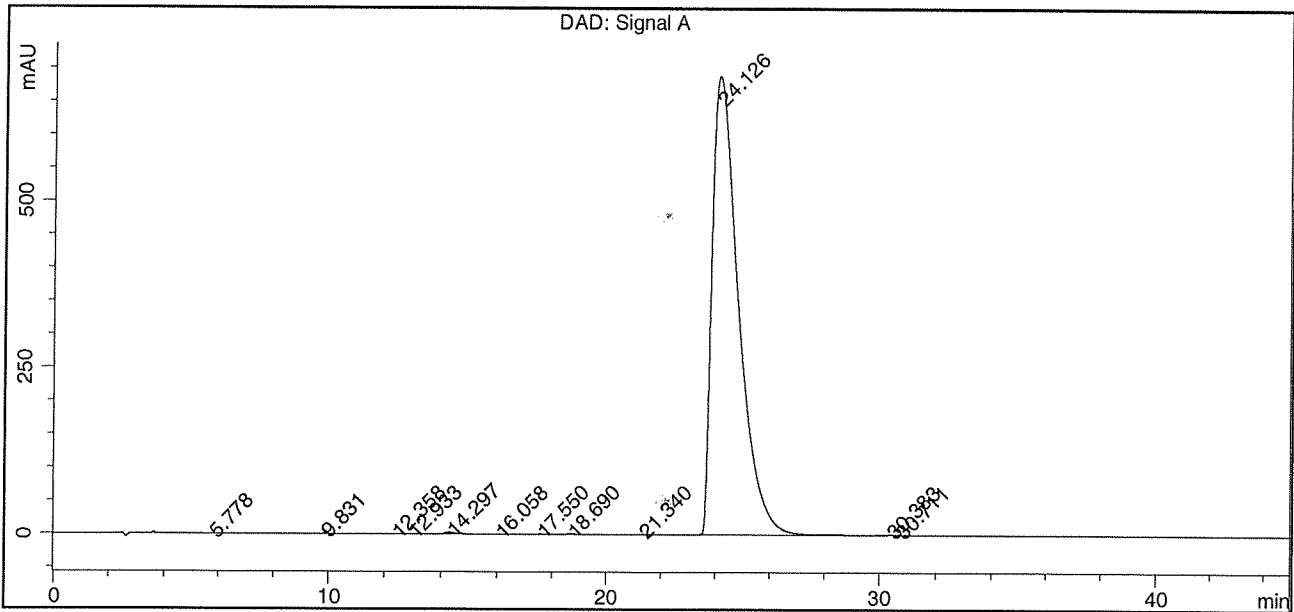
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BDG - Analysis of Amiodarone-d4 HCl

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
 Mobile Phase : 20:34:46 EP Buffer pH=4.9 : Methanol : Acetonitrile
 EP Buffer : 200 mL Water + 0.6 mL glacial Acetic Acid to pH=4.9 using dilute Ammonia solution
 Flow Rate : 1.0 mL/min Injection Volume : 10 uL
 Sample Solvent : 50:50 Water : Acetonitrile Detection : UV at 240 nm

Sample Name	BDG 12433.4	Instrument	AnalyticalLC01
Acquisition	10/10/2016, 12:37:44	Method (rev.)	LC10479a (11)
Sequence	BDG_10Oct2016a - Reprocessed	Vial Position	1
Operator	solvation010\cerityadmin	Injection	1 of 1



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	5.78 min	0.3113	4.5604	0.2109 min	0.010 %
2	9.83 min	0.7360	19.9773	0.3807 min	0.042 %
3	12.36 min	0.4321	11.2217	0.3750 min	0.024 %
4	12.93 min	0.2472	7.9470	0.4390 min	0.017 %
5	14.30 min	2.6356	82.5119	0.4452 min	0.176 %
6	16.06 min	0.4735	15.2376	0.4715 min	0.032 %
7	17.55 min	0.6502	20.5541	0.4568 min	0.044 %
8	18.69 min	0.8482	28.2010	0.5079 min	0.060 %
9	21.34 min	0.6181	63.8301	1.2368 min	0.136 %
10	24.13 min	688.7618	46723.1408	1.0314 min	99.380 %
11	30.38 min	0.3624	17.9095	0.6325 min	0.038 %
12	30.71 min	0.3856	19.3204	0.6165 min	0.041 %