BDG SYNTHESIS

Certificate of Analysis

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

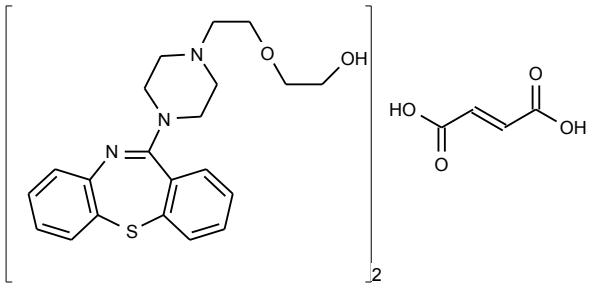
Barry Dent

Barry R. Dent, PhD, Director
7 March 2011

Name: **Quetiapine Hemifumarate**

CAS Number: 111974-72-2

Structure:



Molecular Weight: $2C_{21}H_{25}N_3O_2S{\cdot}C_4H_4O_4$ = 883.09

Lot Number: BDG 5203

Appearance: White, crystalline solid

Corrected Purity: 99.8 % (HPLC) - 0.3 % (ethanol) = 99.5 %

Re-test Date: 7 March 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.

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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 ethanol (0.3 % *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 (ESI+)

Found *m/z* 384.1749. $C_{21}H_{26}N_3O_2S$ $[M+H]^+$ requires *m/z* 384.1746. The deviation of 0.8 ppm is within normally accepted limits for the establishment of identity by HRMS.

HPLC

A somewhat broadened, symmetrical peak is observed (99.8 %). The small peak at 2.6 minutes corresponds to fumaric acid, and is therefore excluded from the measurement. 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 62.44, H 6.04, N 9.43 %
$2C_{21}H_{25}N_3O_2S{\cdot}C_4H_4O_4$	Requires:	C 62.56, H 6.16, N 9.52 %

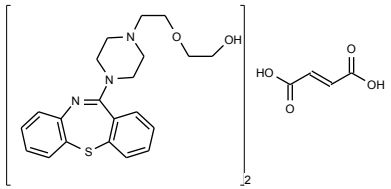
The elemental analyses fall within generally accepted limits for establishing the molecular formula given. The results may also be taken to imply the absence of significant quantities of water or inorganic salts (which have not been elsewhere tested for because of sample size limitations).

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

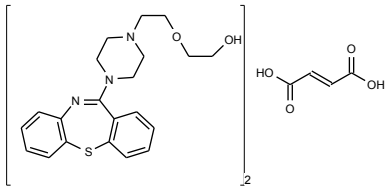
Proton NMR Spectrum of Quetiapine Hemifumarate in DMSO-d_6



Lot Number: BDG 5203

BDG SYNTHESIS

Carbon-13 NMR Spectrum of Quetiapine Hemifumarate in DMSO-d_6

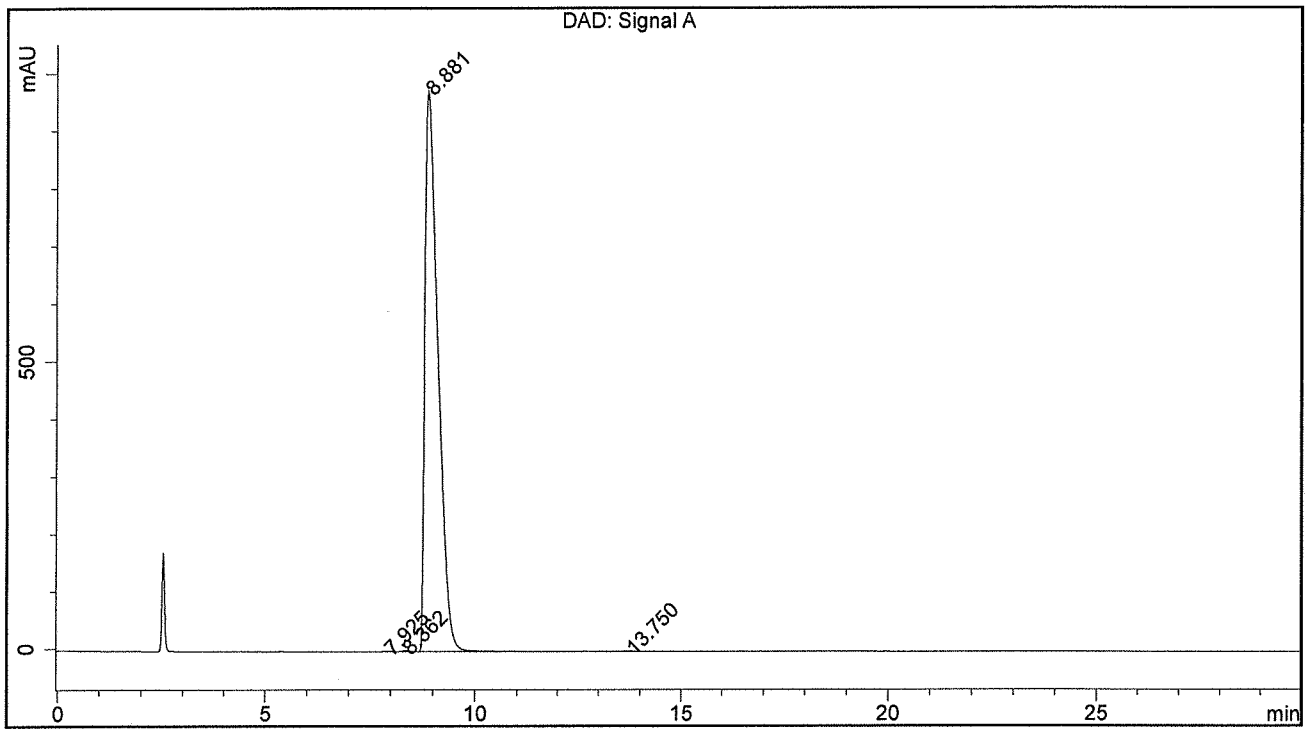


Lot Number: BDG 5203

BDG - Analysis of Quetiapine Hemifumarate

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
Mobile Phase : 70:30 50mM Potassium diHydrogen Phosphate pH=3.0 : Acetonitrile
Flow Rate : 1.0 mL/min
Sample Solvent : 1:1 Water : Acetonitrile
Injection Volume : 10 uL
Column Temperature : 20C
Detection : UV at 250 nm

Sample Name	BDG 5203	Instrument	AnalyticalLC01
Acquisition	07/03/2011, 09:30:38	Method (rev.)	LC10429b (3)
Sequence	BDG_07Mar2011b	Vial Position	1
Operator	solvation010\cerityadmin	Injection	1 of 1



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	7.92 min	0.8517	9.5131	0.1743 min	0.045 %
2	8.36 min	1.8193	20.0820	0.1708 min	0.095 %
3	8.88 min	974.4622	21091.6656	0.3225 min	99.804 %
4	13.75 min	0.5719	11.7978	0.2987 min	0.056 %