



BDG SYNTHESIS

Certificate of Analysis

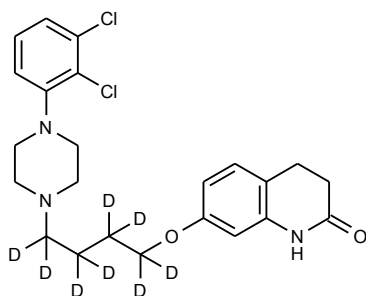
BDG Synthesis certifies that this reference material meets or exceeds the specifications stated herein.

Neil Beare

Neil Beare, PhD, Director
27 March 2015

Name: Aripiprazole-d₈
CAS Number: 129722-12-9 (unlabelled)

Structure:



Molecular Weight: C₂₃H₁₉D₈Cl₂N₃O₂ = 456.44
Lot Number: BDG 5070.2
Appearance: White, crystalline solid
Corrected Purity: 94.5 % (HPLC) - 0.2 % (diethyl ether) - 1.9 % (water) = 92.4 %
Isotopic Purity: Under 0.5 % d₀
Re-test Date: 27 March 2020
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 absent, compared with the spectrum of unlabelled material, indicating clean deuteration.

Residual Solvents: a small amount of diethyl ether (0.2 % w/w) is observed.

Impurities: traces of unidentified impurities are seen in the baseline.

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 the spectrum of unlabelled material, indicating clean deuteration.

High-resolution Mass Spectrum (ESI+)

Found m/z 456.2067. $C_{23}H_{20}D_8Cl_2N_3O_2$ $[M+H]^+$ requires m/z 456.2052. The deviation of 3.1 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, symmetrical peak is observed (94.5 %). 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 59.43, H 4.15, D 3.50, N 8.80 %
$C_{23}H_{19}D_8Cl_2N_3O_2 \cdot 0.5H_2O$	Requires:	C 59.35, H 4.33, D 3.46, N 9.03 %, H_2O 1.94 %
$C_{23}H_{19}D_8Cl_2N_3O_2$	Requires:	C 60.52, H 4.20, D 3.53, N 9.21 %

The elemental analyses fall somewhat outside those expected for anhydrous material; the presence of water is reasonably expected from the method of purification and/or the type of material, and the "best-fit" hydrated molecular formula is given. In the absence of a Karl-Fischer water analysis, we recommend that the "best-fit" water content be used when determining corrected purity.

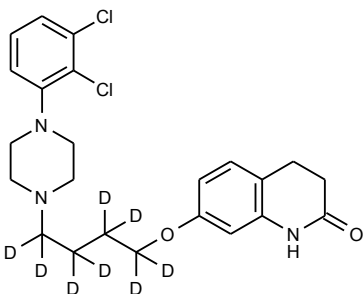
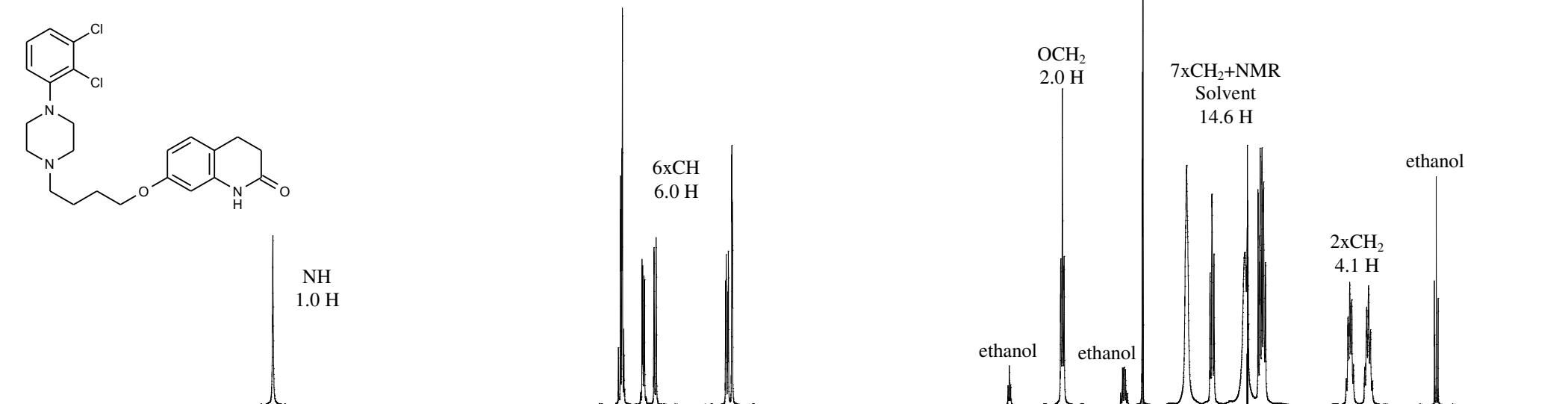
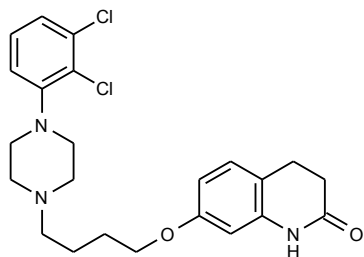
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials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

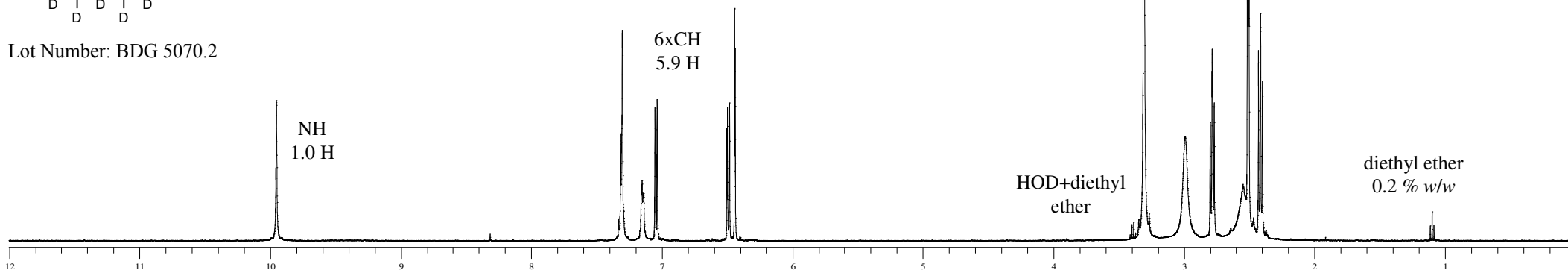


Proton NMR Spectrum of Aripiprazole (top) and Aripiprazole-d₈ (bottom) in DMSO-d₆

BDG SYNTHESIS



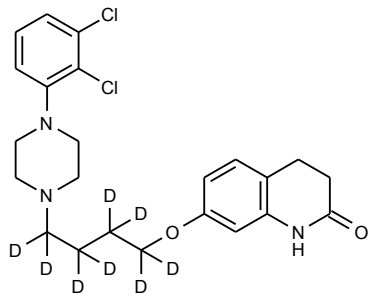
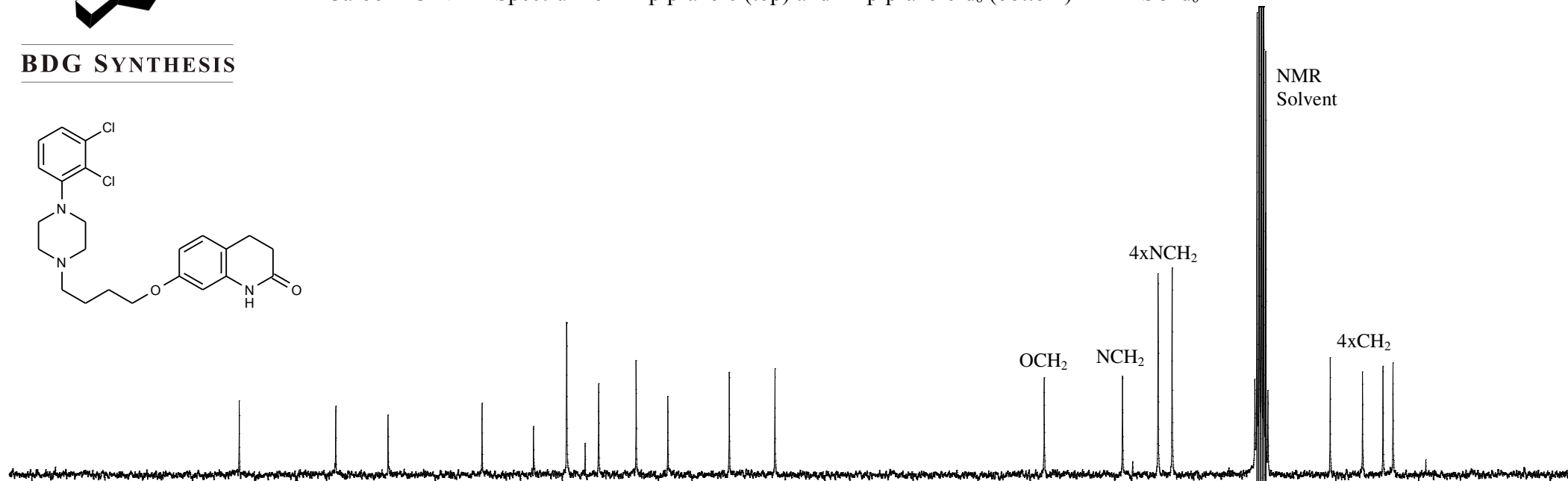
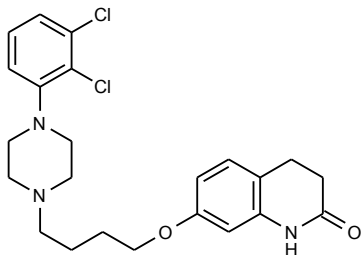
Lot Number: BDG 5070.2



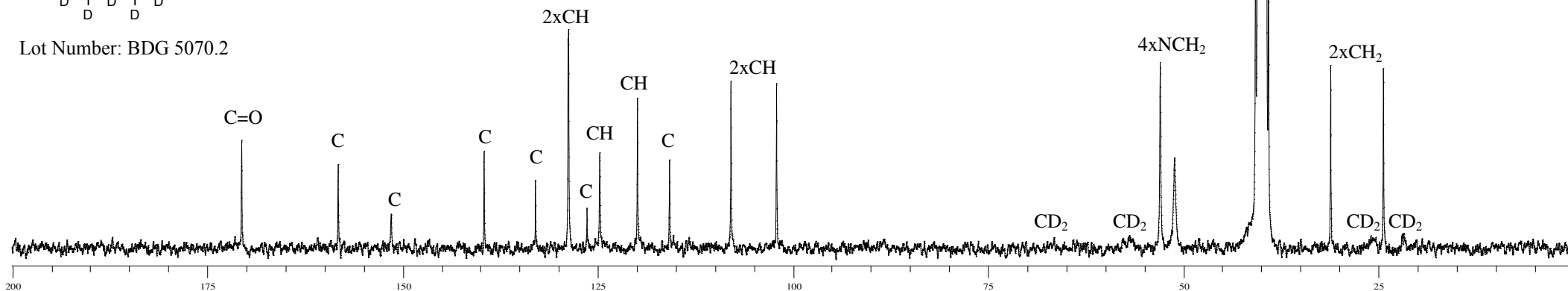


Carbon-13 NMR Spectrum of Aripiprazole (top) and Aripiprazole-d₈ (bottom) in DMSO-d₆

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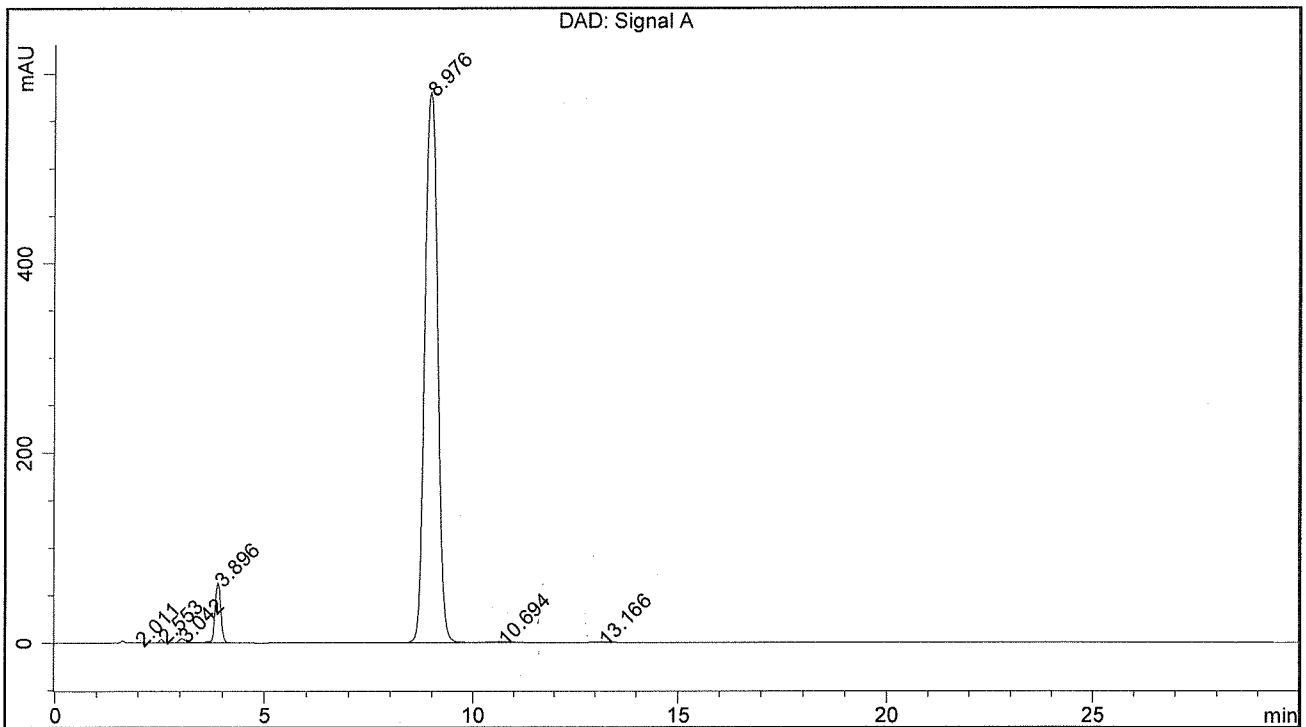
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BDG - Analysis of Aripiprazole-d8

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
 Guard : Phenomenex Security Guard C18 4 x 3 mm
 Mobile Phase : 15:85:0.1 Water : Methanol : Triethylamine
 Flow Rate : 1.0 mL/min
 Sample Solvent : Mobile Phase
 Column Temperature : 30C
 Injection Volume : 10 uL
 Detection : UV at 254 nm

Sample Name	BDG 5070.2	Instrument	AnalyticalLC01
Acquisition	27/03/2015, 10:21:47	Method (rev.)	LC10524b (3)
Sequence	BDG_27Mar2015a - Reprocessed	Vial Position	52
Operator	solvation010\cerityadmin	Injection	1 of 1



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	2.01 min	0.5655	3.8851	0.1082 min	0.029 %
2	2.55 min	3.6960	23.5411	0.1023 min	0.176 %
3	3.04 min	4.2926	48.8432	0.1847 min	0.365 %
4	3.90 min	62.7803	595.6843	0.1507 min	4.447 %
5	8.98 min	579.9022	12653.9089	0.3546 min	94.476 %
6	10.69 min	0.8974	39.0004	0.5590 min	0.291 %
7	13.17 min	0.7892	28.9256	0.4516 min	0.216 %