



BDG SYNTHESIS

Certificate of Analysis

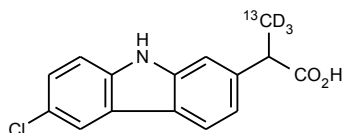
BDG Synthesis certifies that this reference material meets or exceeds the specifications stated herein.

Barry Dent

Barry R. Dent, PhD, Director
29 January 2007

Name: Carprofen-¹³C,₃
CAS Number: 53716-49-7 (unlabelled)

Structure:



Molecular Weight: C₁₄¹³CH₉D₃ClNO₂ = 277.73

Lot Number: BDG 8218.3

Appearance: White, crystalline solid

Corrected Purity: 99.7 % (HPLC) - 0.2 % (ethyl acetate) = 99.5 %

Isotopic Purity: Under 0.5 % d₀

Re-test Date: 29 January 2012

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: a small amount of ethyl acetate (0.2 % w/w) and a trace (under 0.1 % w/w) of hexanes 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: the signal for the labelled carbon of the methyl group appears as a large multiplet at 18.4 ppm.

High-resolution Mass Spectrum (ESI+)

Found m/z 300.0664. $C_{14}^{13}CH_9D_3CINNaO_2 [M+Na]^+$ requires m/z 300.0671. The deviation of 1.4 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 (99.7 %). 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 65.24, H 3.28, D 2.19, N 5.12 %
$C_{14}^{13}CH_9D_3CINO_2$	Requires:	C 65.23, H 3.27, D 2.18, N 5.04 %

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).

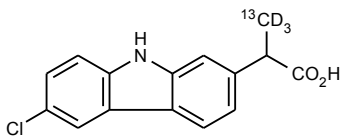
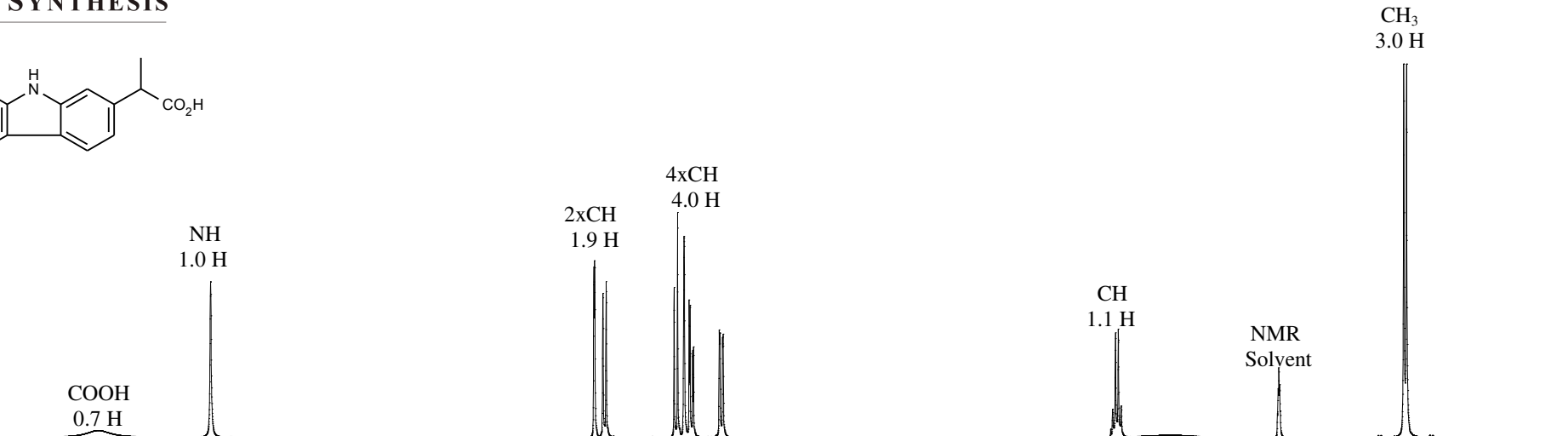
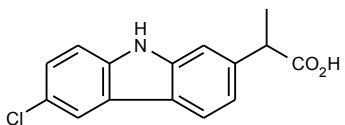
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials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

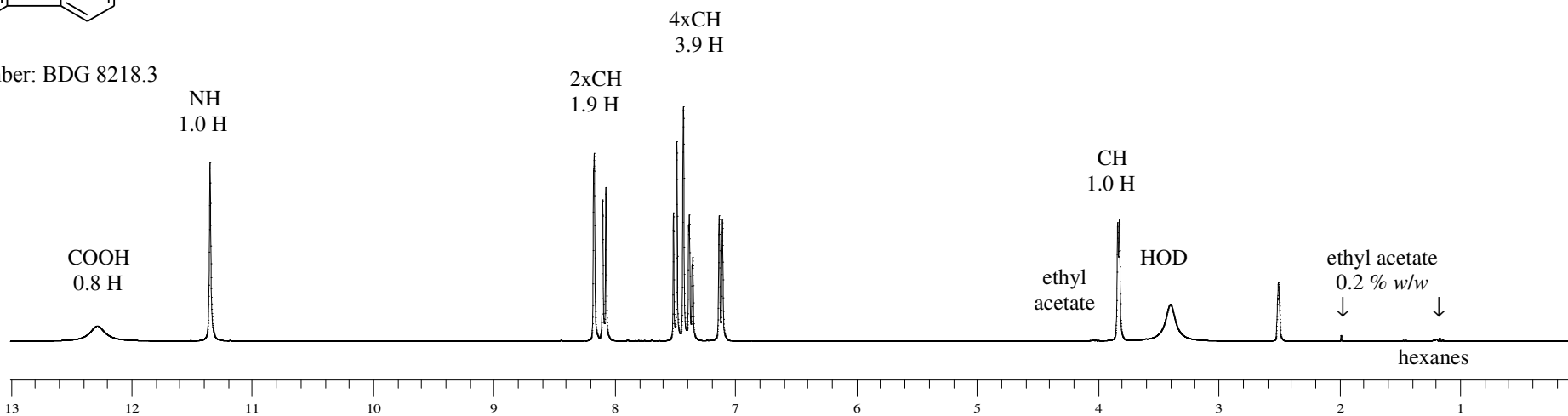


Proton NMR Spectrum of Carprofen (top) and Carprofen-¹³C,₃ (bottom) in DMSO-d₆

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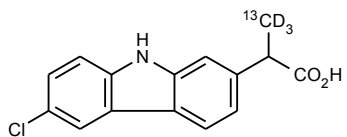
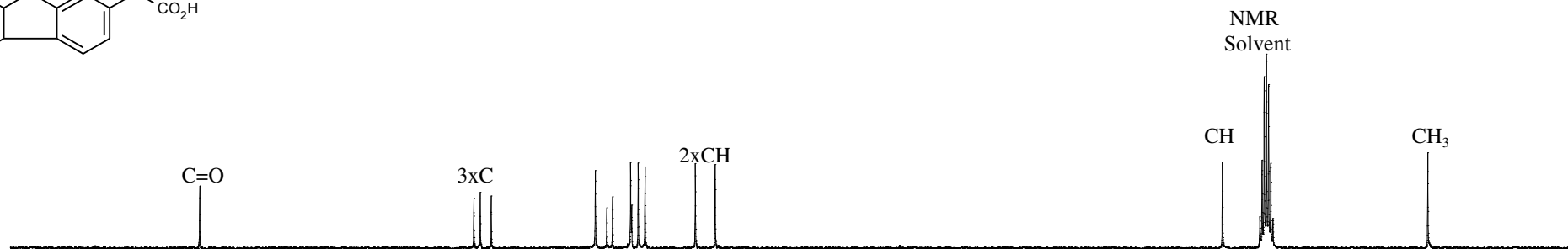
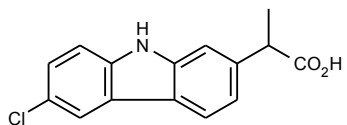
Lot Number: BDG 8218.3



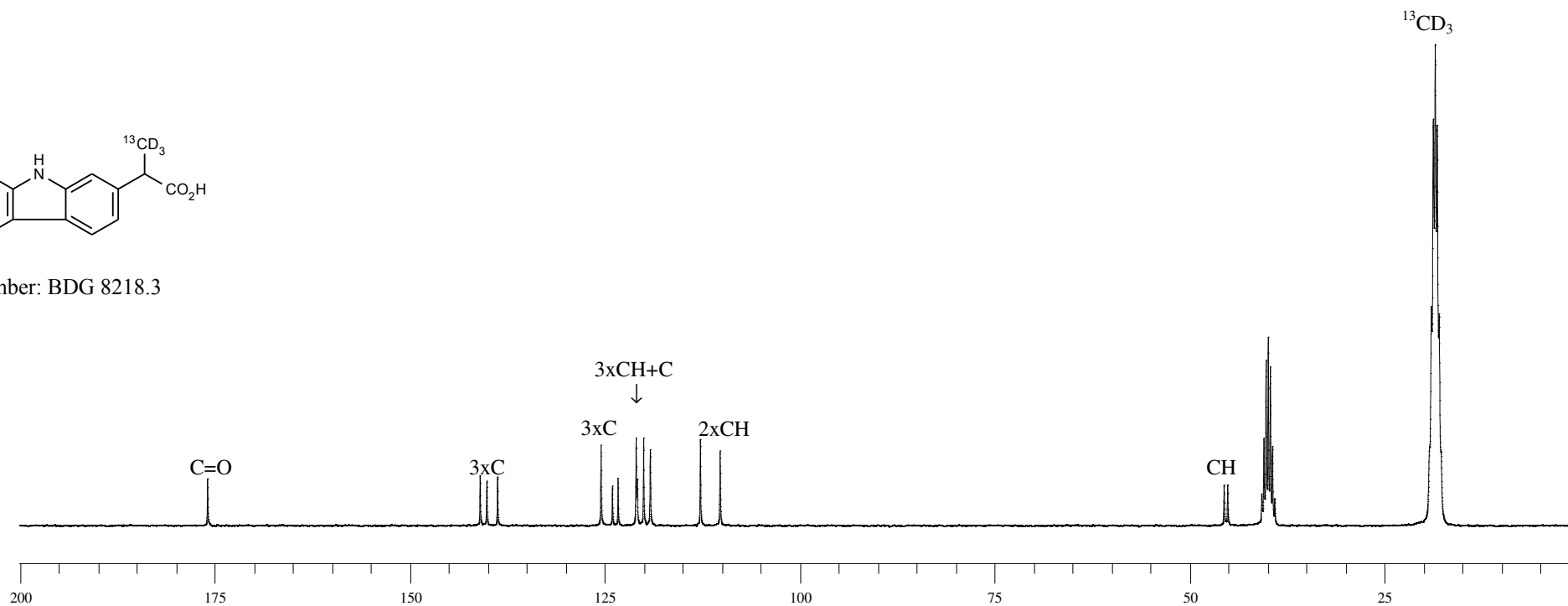


Carbon-13 NMR Spectrum of Carprofen (top) and Carprofen-¹³C,_d₃ (bottom) in DMSO-d₆

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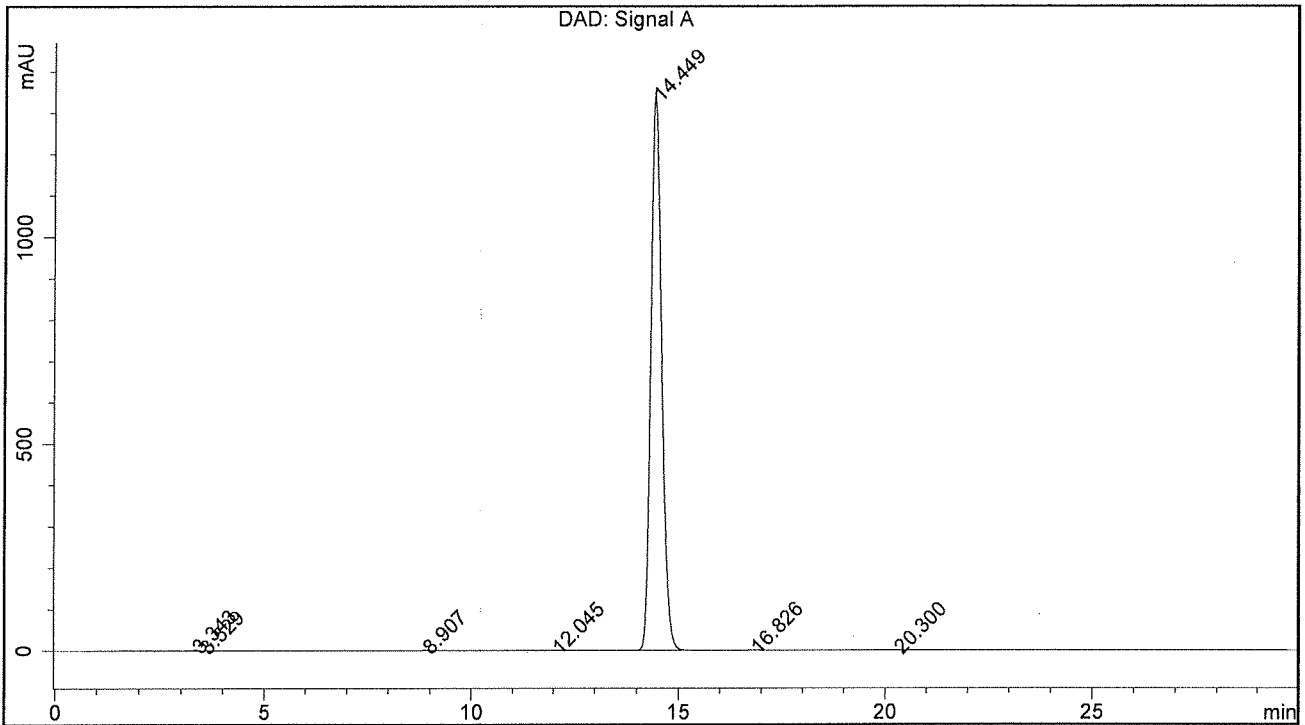
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BDG - Analysis of Carprofen-13C,D3

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
 Mobile Phase : 50:49:1 Acetonitrile : Water : Acetic Acid
 Flow Rate : 1.0 mL/min
 Sample Solvent : Mobile Phase
 Column Temperature : 20C
 Injection Volume : 10 uL
 Detection : UV at 260 nm

Sample Name	BDG 8218.3	Instrument	AnalyticalLC01
Acquisition	24/01/2007, 19:19:57	Method (rev.)	LC10137a (3)
Sequence	BDG_24Jan2007d - Reprocessed	Vial Position	1
Operator	solvation010\cerityadmin	Injection	2 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	3.34 min	2.6219	14.9799	0.0887 min	0.062 %
2	3.53 min	0.4231	2.9834	0.1043 min	0.012 %
3	8.91 min	1.0196	11.8342	0.1794 min	0.049 %
4	12.04 min	0.3411	5.2017	0.2339 min	0.021 %
5	14.45 min	1342.3642	24172.9749	0.2761 min	99.722 %
6	16.83 min	0.9437	20.2863	0.3348 min	0.084 %
7	20.30 min	0.4579	12.0616	0.3593 min	0.050 %