



## BDG SYNTHESIS

### Certificate of Analysis

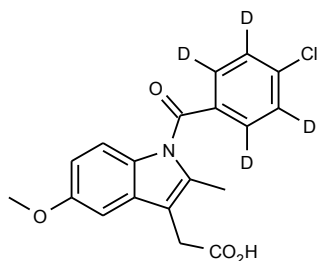
BDG Synthesis certifies that this reference material meets or exceeds the specifications stated herein.

*Neil Beare*

Neil Beare, PhD, Director  
21 June 2017

**Name:** Indomethacin-d<sub>4</sub>  
**CAS Number:** 53-86-1 (unlabelled)

**Structure:**



**Molecular Weight:** C<sub>19</sub>H<sub>12</sub>D<sub>4</sub>ClNO<sub>4</sub> = 361.81

**Lot Number:** BDG 6688.4

**Appearance:** Off-white, crystalline solid

**Purity By HPLC:** 98.6 %

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

**Re-test Date:** 21 June 2022

**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 the spectrum of unlabelled material, indicating clean deuteration.

Residual Solvents: a trace (under 0.1 % w/w) of acetone 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 the spectrum of unlabelled material, indicating clean deuteration.

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

Found  $m/z$  384.0920.  $C_{19}H_{12}D_4ClNaO_4$   $[M+Na]^+$  requires  $m/z$  384.0911. The deviation of 2.2 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 (98.6 %). 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 63.23, H 3.44, D 2.30, N 3.89 %
$C_{19}H_{12}D_4ClNO_4$	Requires:	C 63.07, H 3.34, D 2.23, N 3.87 %

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).

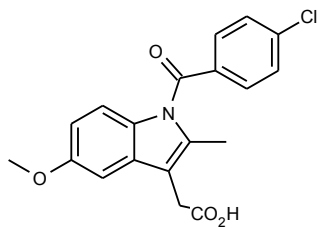
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials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

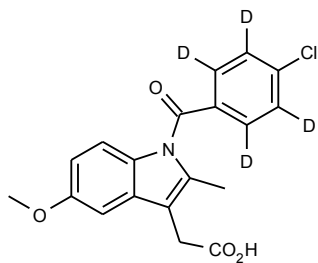
Proton NMR Spectrum of Indomethacin (top) and Indomethacin-d<sub>4</sub> (bottom) in DMSO-d<sub>6</sub>



4×CH  
4.1 H

3×CH  
3.0 H

HOD



Lot Number: BDG 6688.4

NMR  
solvent

CH<sub>3</sub>  
3.0 H

HOD

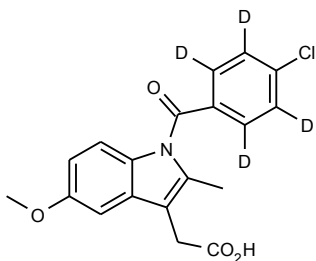
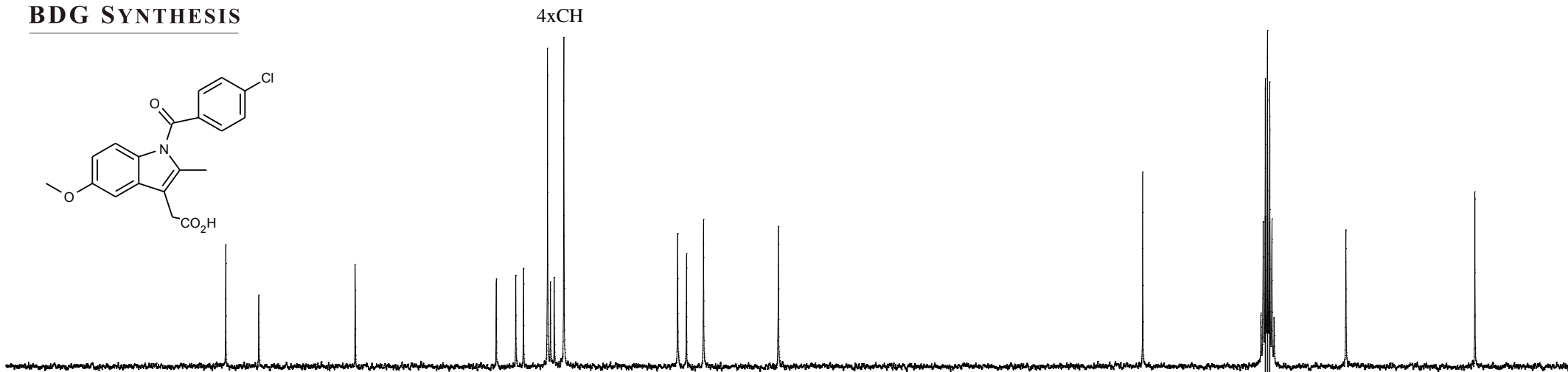
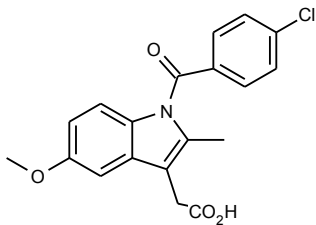
OCH<sub>3</sub>+CH<sub>2</sub>  
5.0 H

3×CH  
3.0 H

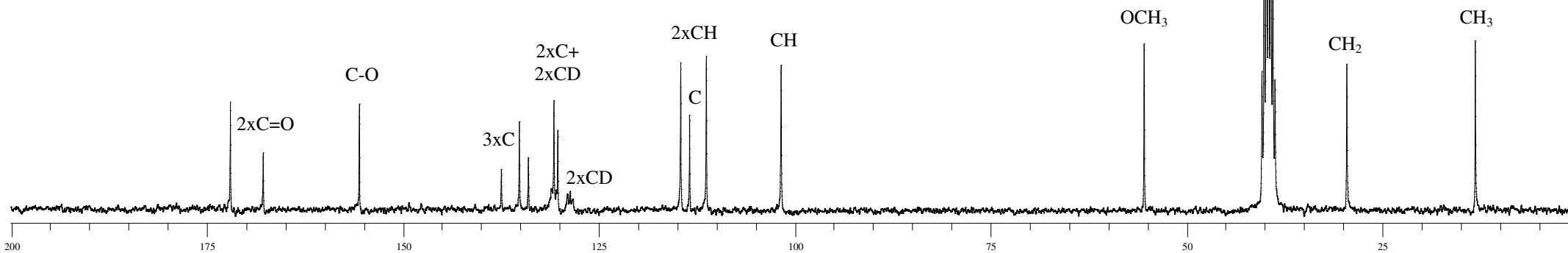


Carbon-13 NMR Spectrum of Indomethacin (top) and Indomethacin-d<sub>4</sub> (bottom) in DMSO-d<sub>6</sub>

**BDG SYNTHESIS**



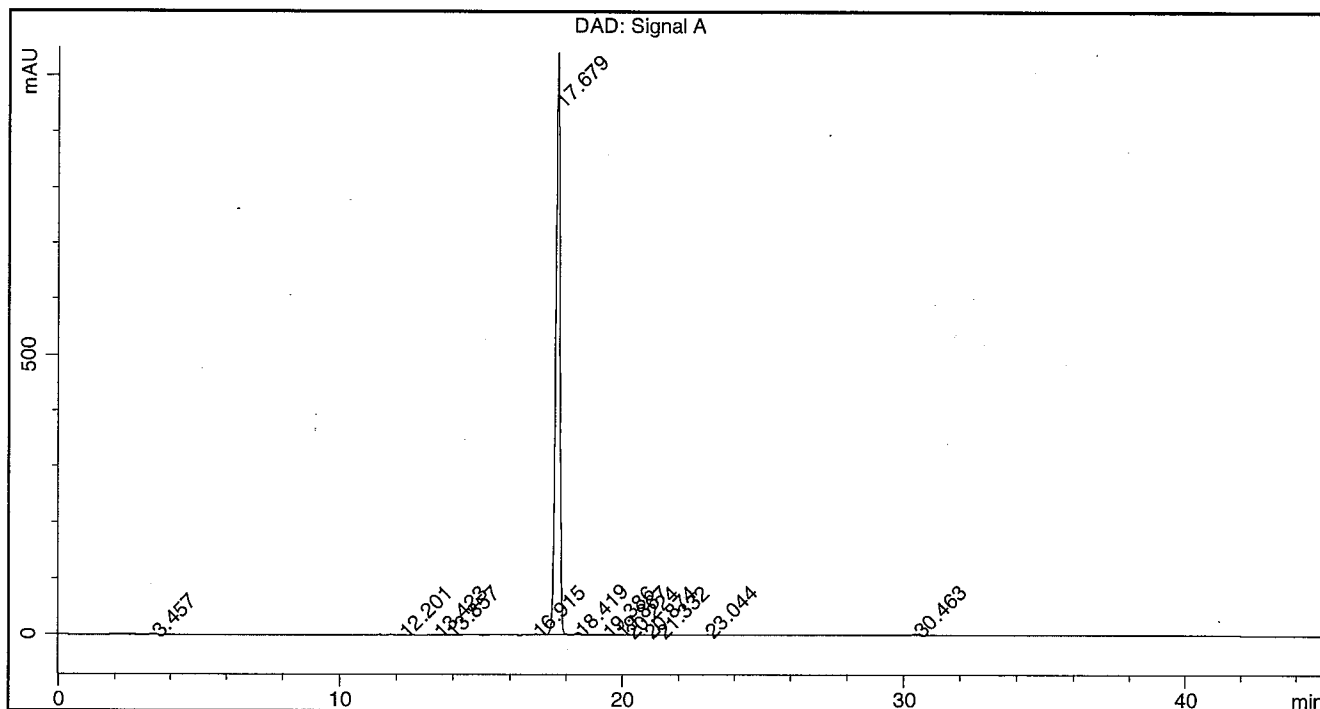
Lot Number: BDG 6688.4



BDG - Analysis of Indomethacin-d4

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm . . . . Guard : Security Guard C18 RP 4 x 3 mm  
 Mobile Phase A: 60:40:0.1 Water : Acetonitrile : Trifluoroacetic Acid  
 Mobile Phase B: 20:80:0.1 Water : Acetonitrile : Trifluoroacetic Acid  
 Gradient (A:B) : T0=100:0, T25=0:100, T38=0:100, T40=100:0, T45=100:0  
 Flow Rate : 1.0 mL/min . . . . Sample Solvent : 1:1 A:B . . . . Column Temperature : 20 C  
 Injection Volume : 10 uL . . . . Detection : UV at 270 nm

<b>Sample Name</b>	BDG 6688.4	<b>Instrument</b>	AnalyticalLC01
<b>Acquisition</b>	21/06/2017, 20:17:20	<b>Method (rev.)</b>	LC10136a ( 12)
<b>Sequence</b>	BDG_21Jun2017b - Reprocessed	<b>Vial Position</b>	1
<b>Operator</b>	solvation010\cerityadmin	<b>Injection</b>	2 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	3.46 min	0.4115	2.3829	0.0876 min	0.022 %
2	12.20 min	0.2832	2.8064	0.1476 min	0.025 %
3	13.42 min	0.2011	2.1496	0.1447 min	0.019 %
4	13.86 min	0.9584	10.3197	0.1616 min	0.093 %
5	16.92 min	1.4246	16.7125	0.1769 min	0.151 %
6	17.68 min	1041.5735	10919.1292	0.1623 min	98.563 %
7	18.42 min	3.6778	39.0094	0.1677 min	0.352 %
8	19.39 min	0.2122	2.7680	0.1722 min	0.025 %
9	19.87 min	0.2176	3.1144	0.2230 min	0.028 %
10	20.22 min	0.2489	2.8911	0.1515 min	0.026 %
11	20.87 min	0.5929	7.0631	0.1790 min	0.064 %
12	21.33 min	0.7307	8.7685	0.1920 min	0.079 %
13	23.04 min	0.8685	10.9986	0.1997 min	0.099 %
14	30.46 min	2.8551	50.1798	0.2650 min	0.453 %