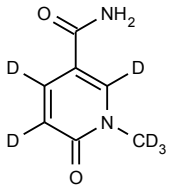
BDG SYNTHESIS

Certificate of Analysis

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

Barry Dent

Barry R. Dent, PhD, Director
3 June 2013

Name:	***N*-Methyl-2-pyridone-5-carboxamide-d_6**
CAS Number:	701-44-0 (unlabelled)
Structure:	
Molecular Weight:	$C_7H_2D_6N_2O_2$ = 158.19
Lot Number:	BDG 8537
Appearance:	White, crystalline solid
Corrected Purity:	99.9 % (HPLC) - 0.4 % (ethanol) = 99.5 %
Isotopic Purity:	Under 0.5 % d_0
Re-test Date:	3 June 2018

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: there has been some loss of label at one of the sites on the pyridone ring, indicating approximately 40 % of the material is d_5 rather than d_6. Signals at the other sites of deuteration are absent or greatly diminished, compared with the spectrum of unlabelled material.
Residual Solvents: a small amount of ethanol (0.4 % *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: one of the carbon signals in the pyridone ring shows some signal for C-H indicating some label loss. Signals at the other sites of deuteration have collapsed into small multiplets compared with the spectrum of unlabelled material.

High-resolution Mass Spectrum (ESI+)

Found *m/z* 181.0851. $C_7H_2D_6N_2NaO_2$ $[M+Na]^+$ requires *m/z* 181.0855. 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 (99.9 %). 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 53.28, H 1.29, D 7.76, N 17.61 %
$C_7H_2D_6N_2O_2$	Requires:	C 53.15, H 1.27, D 7.64, N 17.71 %

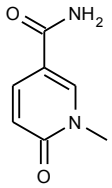
The elemental analyses fall within generally accepted limits for establishing the molecular formula given. The results may also be taken to imply the absence of significant quantities of water or inorganic salts (which have not been elsewhere tested for because of sample size limitations).

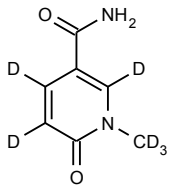
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials 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 *N*-Methyl-2-pyridone-5-carboxamide (top) and *N*-Methyl-2-pyridone-5-carboxamide-d_6 (bottom) in DMSO-d_6





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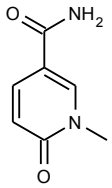
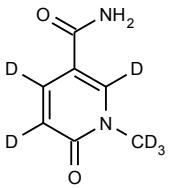
BDG SYNTHESIS

Carbon-13 NMR Spectrum of *N*-Methyl-2-pyridone-5-carboxamide (top) and *N*-Methyl-2-pyridone-5-carboxamide-d_6 (bottom) in DMSO-d_6





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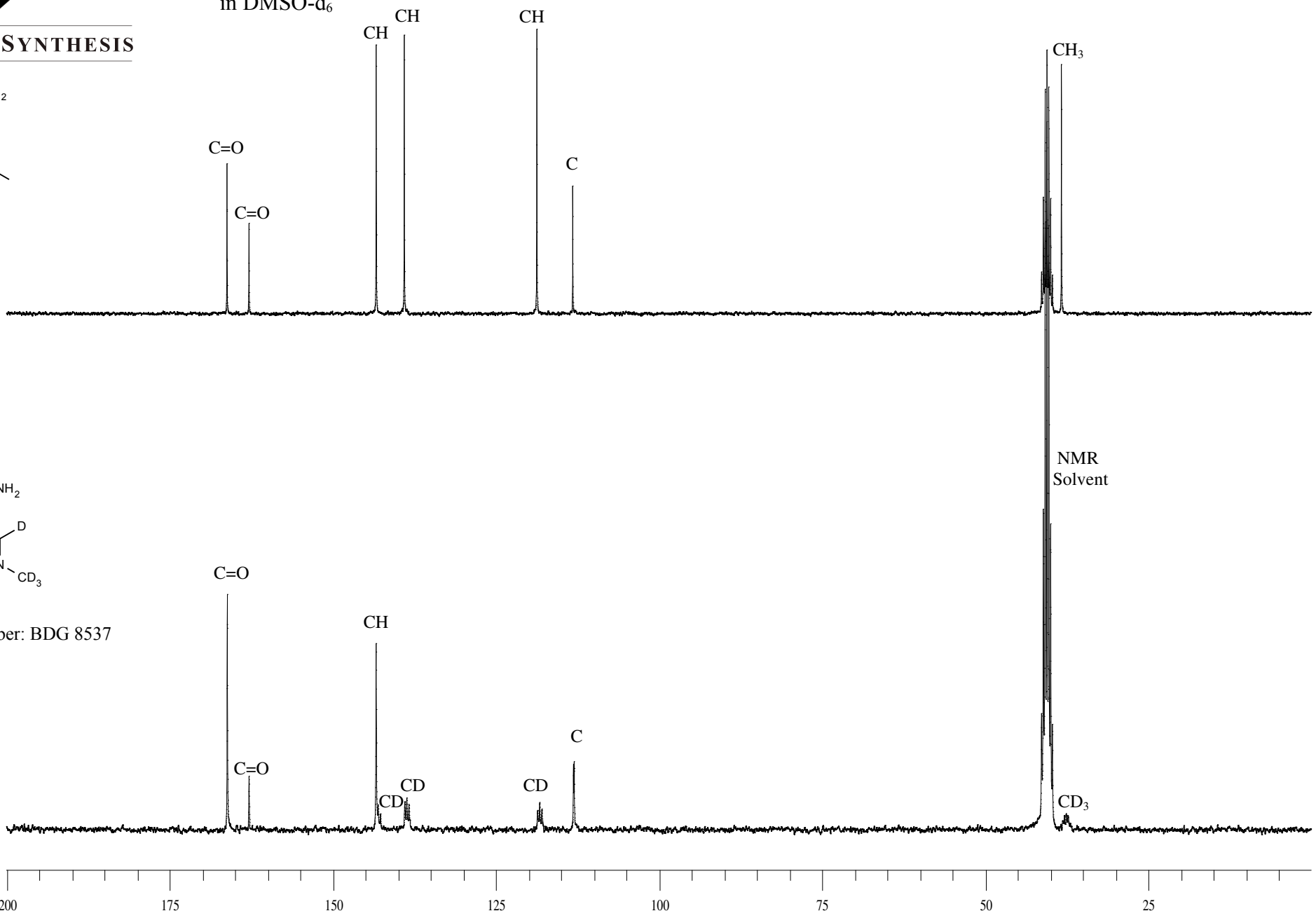
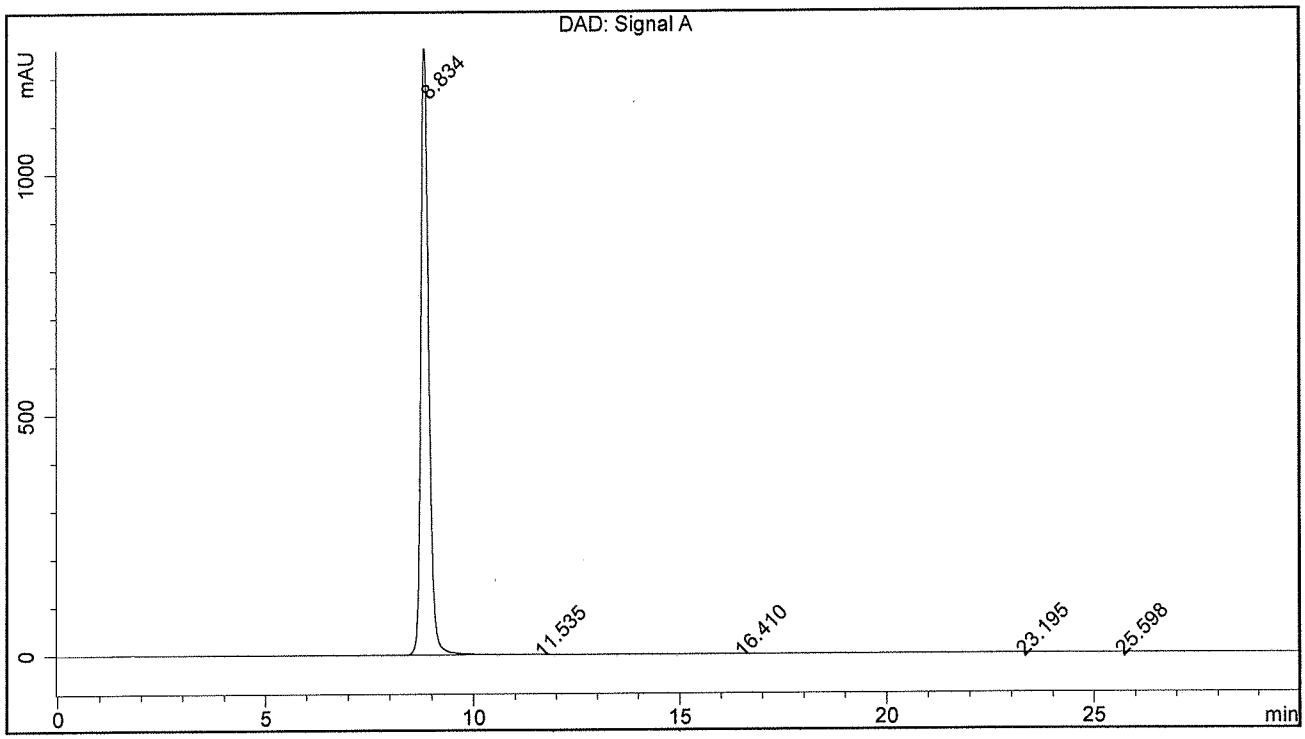


BDG - Analysis of N-Methyl-2-pyridone-5-carboxamide-d6

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
Mobile Phase : 96.5:3.5:0.035 Water : Acetonitrile : Acetic Acid
Flow Rate : 1.0 mL/min
Sample Solvent : Mobile Phase
Column Temperature : 20C
Injection Volume : 10 uL
Detection : UV at 259 nm

Sample Name	BDG 8537	Instrument	AnalyticalLC01
Acquisition	03/06/2013, 17:45:03	Method (rev.)	LC10180e (4)
Sequence	BDG_03Jun2013c - Reprocessed	Vial Position	1
Operator	solvation010\cerityadmin	Injection	1 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	8.83 min	1280.8205	16669.8672	0.1978 min	99.885 %
2	11.53 min	0.2362	3.8802	0.2217 min	0.023 %
3	16.41 min	0.1767	3.7354	0.2567 min	0.022 %
4	23.20 min	0.1216	3.9898	0.4108 min	0.024 %
5	25.60 min	0.1617	7.5913	0.5638 min	0.045 %