



BDG SYNTHESIS

Certificate of Analysis

This material is a research-grade material prepared by custom synthesis. The quantity available is limited, 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 research-grade materials. Research 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.

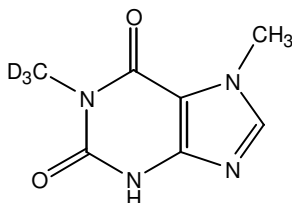
BDG Synthesis certifies that this reference material meets or exceeds the specifications stated in this data sheet.

Barry Dent

Barry R. Dent, PhD, Director
18 January 2007

Name: 1,7-Dimethylxanthine-d₃
CAS Number: none (611-59-6 unlabelled)

Structure:



Molecular Weight: C₇H₅D₃N₄O₂ = 183.19

Lot Number: BDG 6629.1

Appearance: White, crystalline solid

Purity by HPLC: 99.7 %

Isotopic Purity: Under 0.5 % d₀

Expiry Date: 18 January 2012
This expiry date is assigned from experience gained with the material in the laboratory and/or on storage. It is not possible to perform formal storage stability studies because of the small amount of material available.

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:

Source of Material

The material was made by an unambiguous synthetic route, using literature procedures where possible; starting materials were purchased from reputable sources and all intermediates were checked for identity by NMR.

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 absent, compared with what would be expected for unlabelled material, indicating clean deuteration.

Residual solvents: no residual solvents 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: signals at the site of deuteration have collapsed to small multiplets compared with what would be expected for unlabelled material, indicating clean deuteration.

High-resolution mass spectrum (EI+): found m/z 183.0842. $C_7H_5D_3N_4O_2$ $[M]^+$ requires m/z 183.0836.

The deviation of 3.5 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 area %). 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 46.18, H 2.84, D 3.41, N 30.72 %

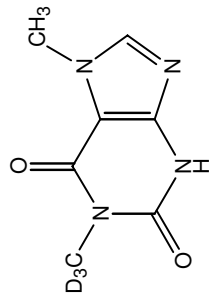
$C_7H_5D_3N_4O_2$ requires: C 45.90, H 2.75, D 3.30, N 30.59 %

The elemental analyses fall within generally accepted limits for establishing the molecular formula given.

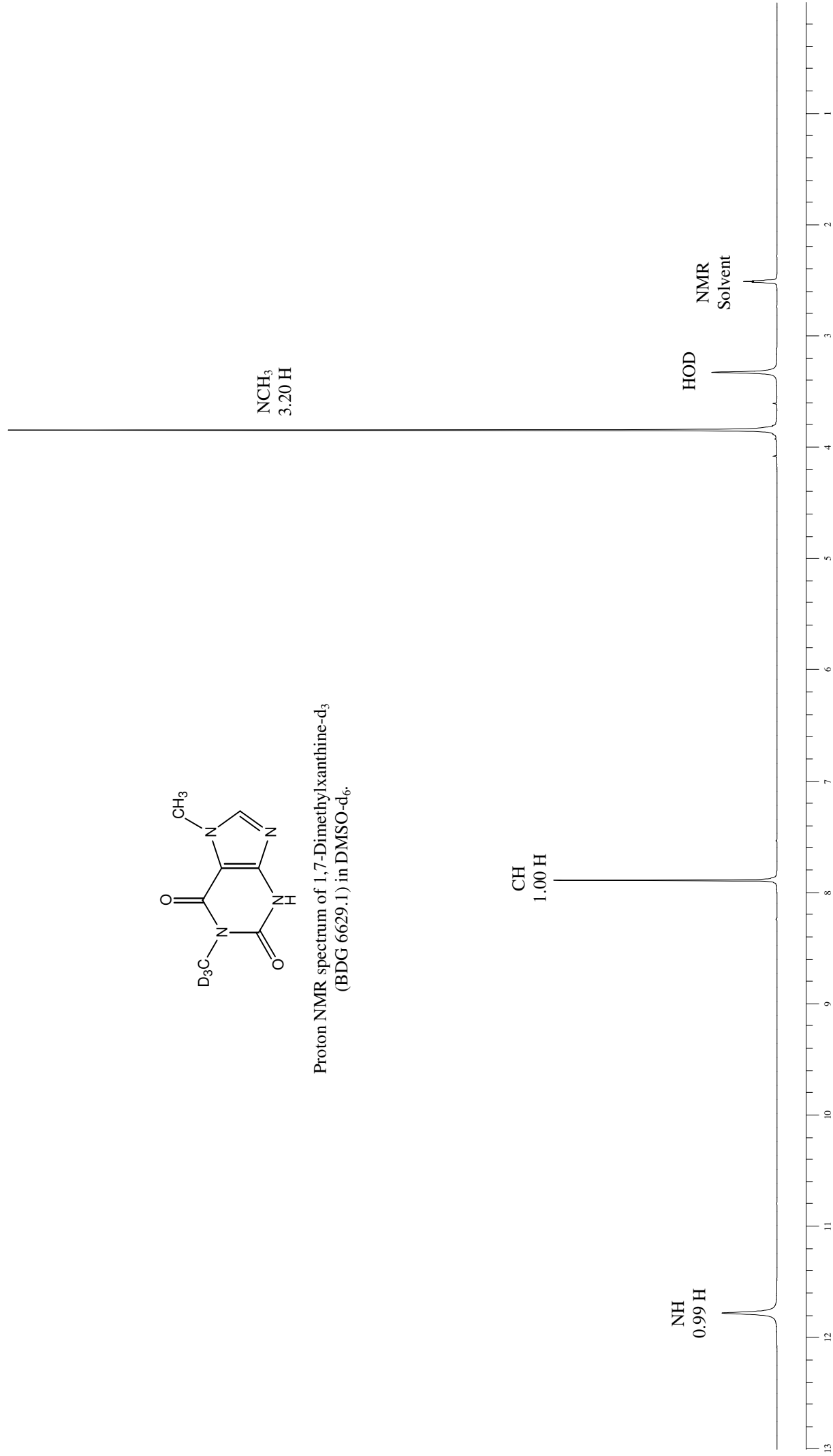
The results may also be taken to imply the absence of significant quantities of water or inorganic salts (which have not been elsewhere tested for because of sample size limitations).



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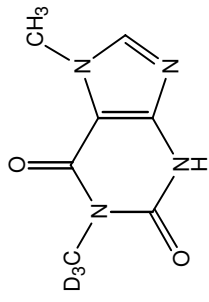


Proton NMR spectrum of 1,7-Dimethylxanthine-d₃
(BDG 6629.1) in DMSO-d₆.

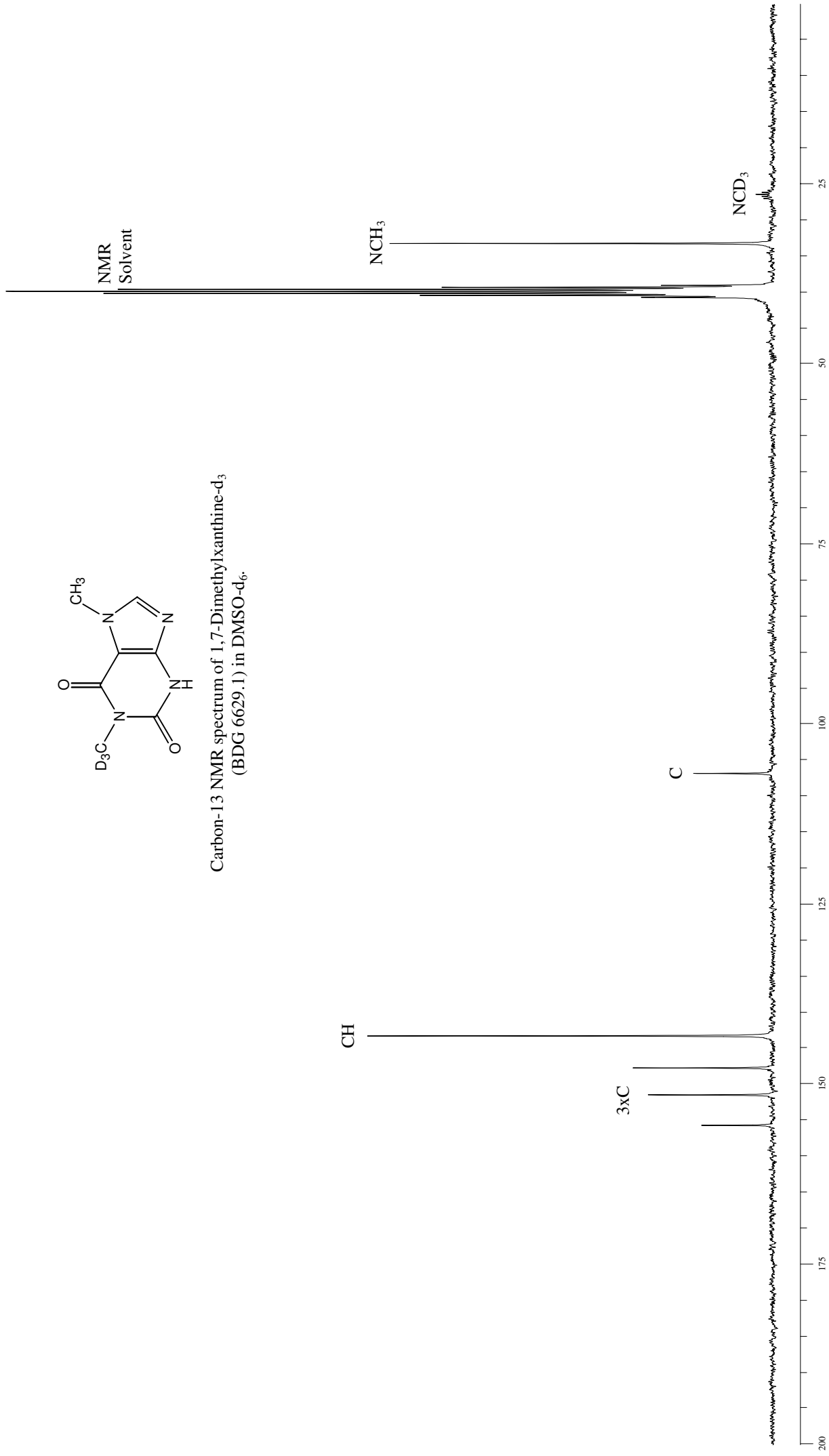




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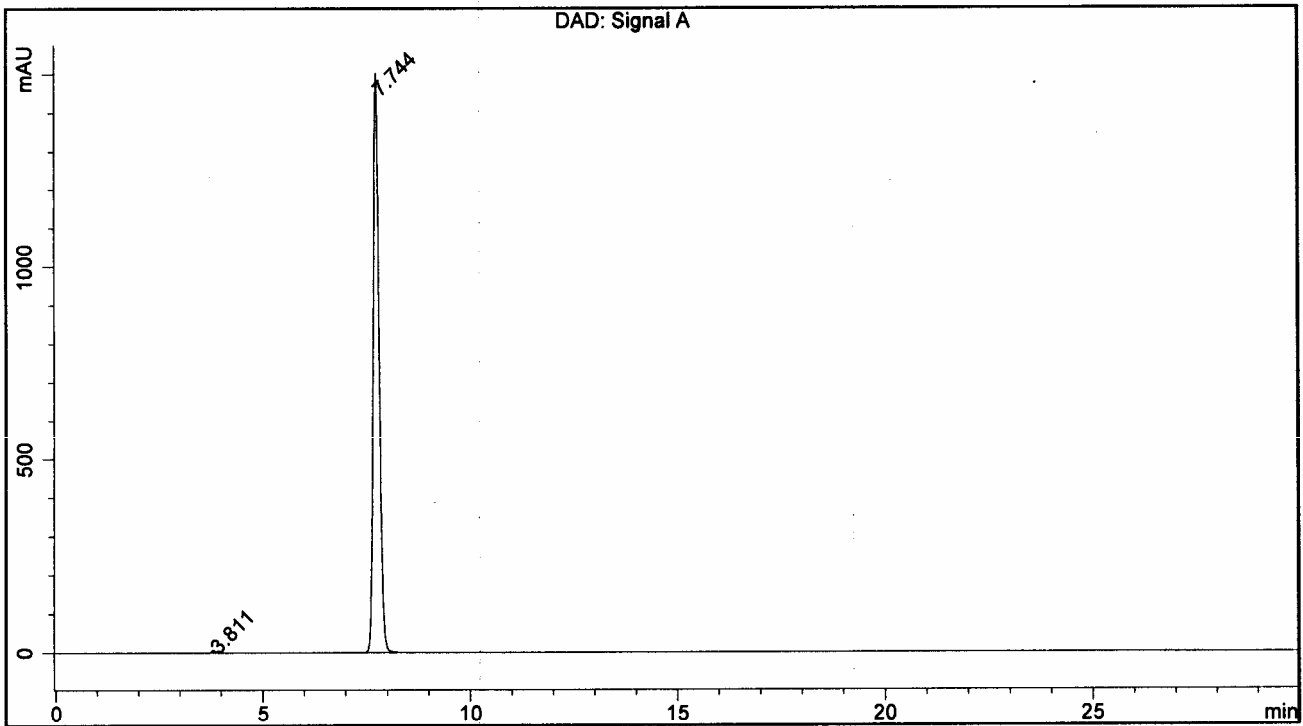
Carbon-13 NMR spectrum of 1,7-Dimethylxanthine- d_3
(BDG 6629.1) in $\text{DMSO-}d_6$.



BDG - Analysis of 1,7-Dimethylxanthine-d3

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
 Mobile Phase : 90:10 10 mM Sodium Acetate + 0.5% Acetic Acid : Acetonitrile
 Flow Rate : 1.0 mL/min
 Sample Solvent : Mobile Phase
 Column Temperature : 20C
 Injection Volume : 10 uL
 Detection : UV at 280 nm
 Run Time : 30 mins

Sample Name	BDG 6629.1	Instrument	AnalyticalLC01
Acquisition	07/01/2007, 14:59:59	Method (rev.)	LC10128a (2)
Sequence	BDG_07Jan2007a	Vial Position	1
Operator	solvation010\cerityadmin	Injection	2 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	3.81 min	7.5894	42.5615	0.0854 min	0.287 %
2	7.74 min	1502.9073	14783.3007	0.1508 min	99.713 %