



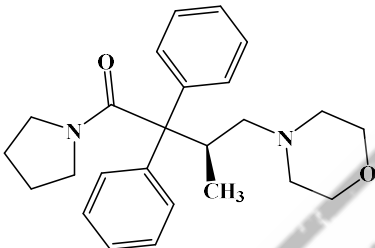
GlobeSynth
Pharma Tech

GlobeSynth Pharma Tech

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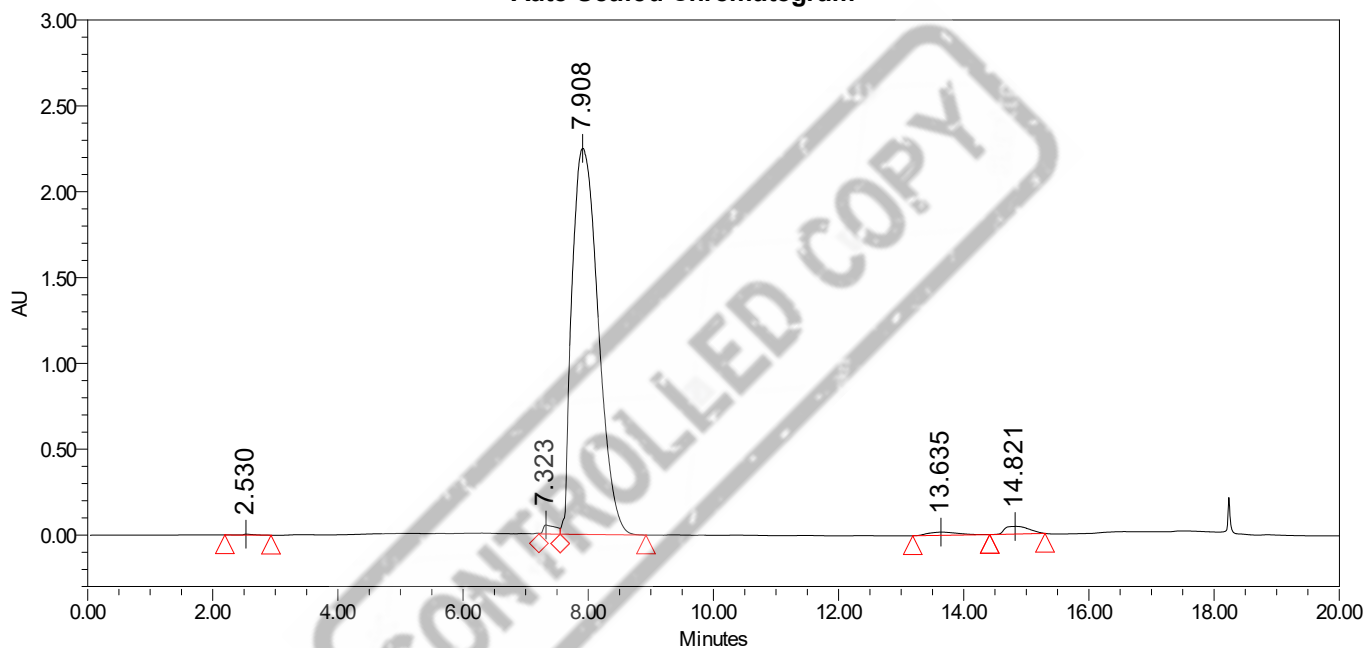
Certificate Of Analysis

Catalogue Name	4-(2-methyl-4-oxo-3,3-diphenyl-4-(1-pyrrolidinyl)butyl)morpholine				
Product Category	Dextromoramide				
Sub-Category	Metabolites, Impurities, Pharmaceutical Standards, Intermediates, Fine Chemicals, Steroids, Intermediates				
Chemical Name / Synonyms	(+)2,2-Diphenyl-3-methyl-4-morpholinobutylpyrrolidine ; (3S)-3-methyl-4-(morpholin-4-yl)-2,2-diphenyl-1-(pyrrolidin-1-yl)butan-1-one ; (+)-1-(3-methyl-4-morpholino-2,2-diphenylbutyl)pyrrolidine ; D-2,2-diphenyl-3-methyl-4-morpholinobutylpyrrolidine ; (+)-4-(2-methyl-4-oxo-3,3-diphenyl-4-(1-pyrrolidinyl)butyl)morpholine ; 1-((3S)-3-methyl-4-(4-morpholinyl)-1-oxo-2,2-diphenylbutyl)pyrrolidine				
Catalog Number	GS.83.DXO.00	Manufacturing Date	20.03.2026		
Batch Number	GS-DXO-02600	Date of Analysis (HPLC)	30.03.2026		
CAS Number	357-56-2	Retest Date (HPLC)	30.03.2029		
Chemical Structure :		Mol. Weight	392.53		
		Mol. Formula	C25H32N2O2		
		Description	Colorless Gummie Liquid		
		Solubility	Methanol, DMSO		
		Storage conditions : Store in a tight container and keep in between 2-8°C temperature (Refrigerator). For long term storage at -20 deg C.			
Applications:	Dextromoramide is a potent, fast-acting, synthetic opioid analgesic used to treat severe, acute, or chronic pain, particularly for cancer-related pain, post-operative, and obstetrical pain				
I. Identity					
S.No.	Test	Specification	Results		
1	HPLC Purity(%)	NLT 95%	96.12% (Chromatogram Attached)		
2	IR	To conform to structure	Conforms (Spectra Attached)		
3	HNMR	To conform to structure	Conforms (Spectra Attached)		
4	Mass/LC MS	To conform to structure	Conforms (Spectra Attached)		
PO Reference No.	N/A	Pack Size:	25 MG	Vial Nos :	1
Shipment Condition & Date : Should be shipped under Amber vial, between 15° and 30° Centigrade & N/A		Place :	Salem, TN		
		This certificate is valid for Three years from the date of shipment provided the substance is stored under the recommended conditions. (Note: Use for research and Analytical purpose only)			
Prepared By		Checked By		Approved By	
Mr. R. Mani (Sr. Executive)		Dr. Nand Lal (Jr. Scientist)		Mr. Bharat Patel (QC Head)	

SAMPLE INFORMATION

Sample Name:	GS-DXO-02600	Acquired By:	System
Sample Type:	Standard	Sample Set Name:	
Vial:	23	Acq. Method Set:	general_inst
Injection #:	1	Processing Method	general__proc1
Injection Volume:	5.00 ul	Channel Name:	210.0nm@1
Run Time:	20.0 Minutes	Proc. Chnl. Descr.:	2998 PDA 210.0 nm (2998)
Date Acquired:	30-03-2026 16:43:40 IST		
Date Processed:	30-03-2026 17:24:04 IST		

Auto-Scaled Chromatogram



Peak Results

	Name	RT	Area	% Area
1		2.530	63709	0.09
2		7.323	753926	1.11
3		7.908	65307820	96.12
4		13.635	618911	0.91
5		14.821	1198136	1.76

Reported by User: System

Report Method: GLOBESYNTH PHARMA

Report Method ID: 22866

Page: 1 of 1

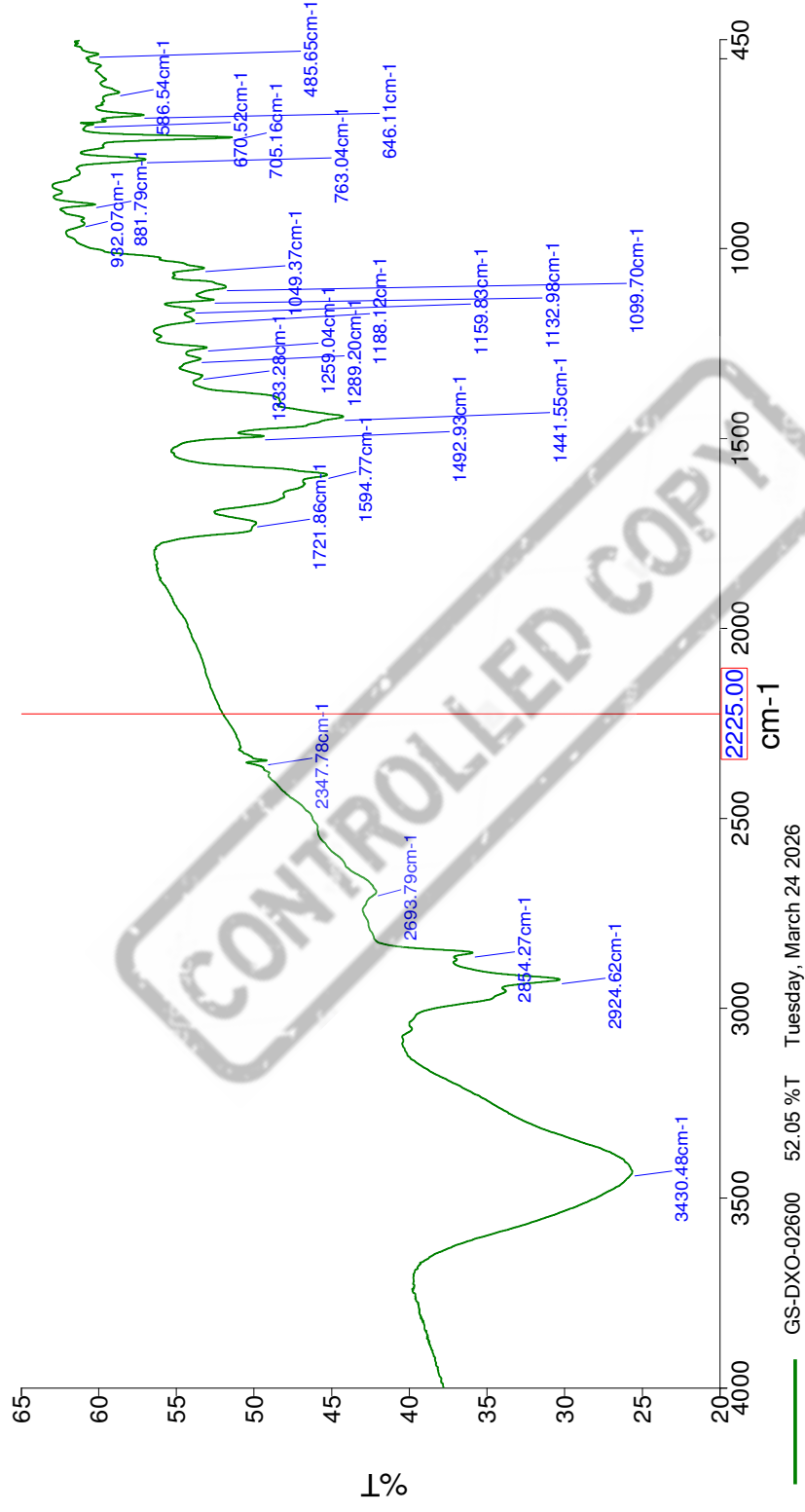
Project Name: 2025_DATA

Date Printed:

30-03-2026

17:26:10 Asia/Calcutta

Analyst
Date
Administrator
24 March 2026 16:17



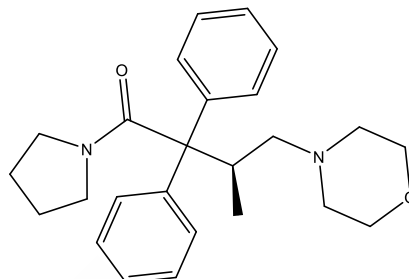
GS-DXO-02600 52.05 %T Tuesday, March 24 2026

Source Spectra Results	
Spectrum Name	Number Of Peaks
GS-DXO-02600	25

List of Peak Area/Height	
Peak Number	X (cm-1) (cm-1)
1	3430.48
2	2924.62
3	2854.27
4	2693.79
5	2347.78
6	1721.86
7	1594.77
8	1492.93
9	1441.55
10	1333.28
11	1289.20
12	1259.04
13	1188.12
14	1159.83
15	1132.98
16	1099.70
17	1049.37
18	932.07
19	881.79
20	763.04
21	705.16
22	670.52
23	646.11
24	586.54
25	485.65

IR INTERPRETATION OF DEXTROMORAMIDE

Catalog Number : GS.83.DXO.00
CAS Number : 357-56-2
Batch Number : GS-DXO-02600
Mol.Wt : 392.53
Mol. Formula : C₂₅H₃₂N₂O₂



Dextromoramide; (3S)-3-Methyl-4-(morpholin-4-yl)-2,2-diphenyl-1-(pyrrolidin-1-yl)butan-1-one
Butanone, 3-methyl-4-(4-morpholinyl)-2,2-diphenyl-1-(1-pyrrolidinyl)-, (3S)-; **357-56-2**; Metabolites, Impurities, Pharmaceutical Standards, Intermediates, Fine Chemicals, Steroids, Intermediates

S.No	Wave number (cm ⁻¹)	Group	Stretch
1	3430.48	Amine Group	-NH
2	1721.86	Carbonyl Group	C=O
3	2924.62	Alkyl Group	H-C-H

The signals of the IR spectrum and their interpretation are consistent with the structural formula.

Checked By

Approved By

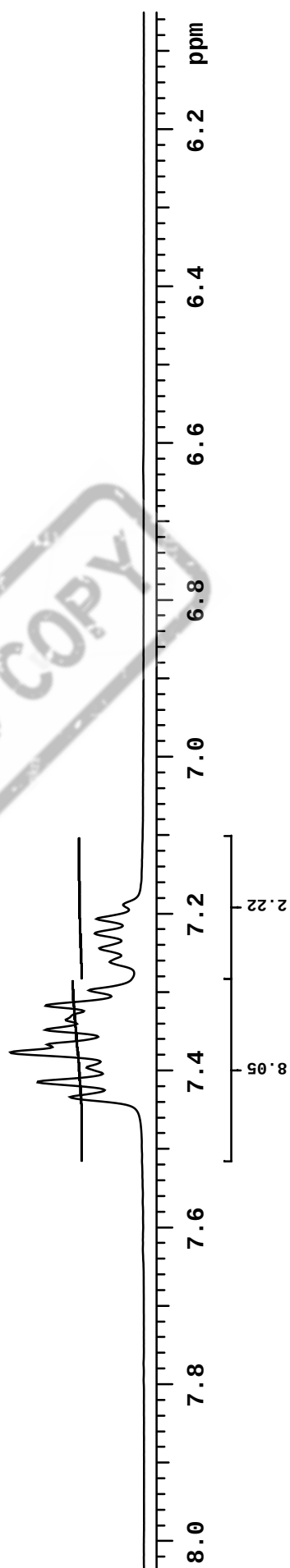
Sample Name: GS-DX0-02600
Data Collected on: localhost.localdomain-vmnrs400
Archive directory: /home/vnmr1/vnmrsys/data/2026/Mar/20260327
Sample directory: GS-DX0-02600_20260327_01
FidFile: GS-DX0-02600-PROTON_01

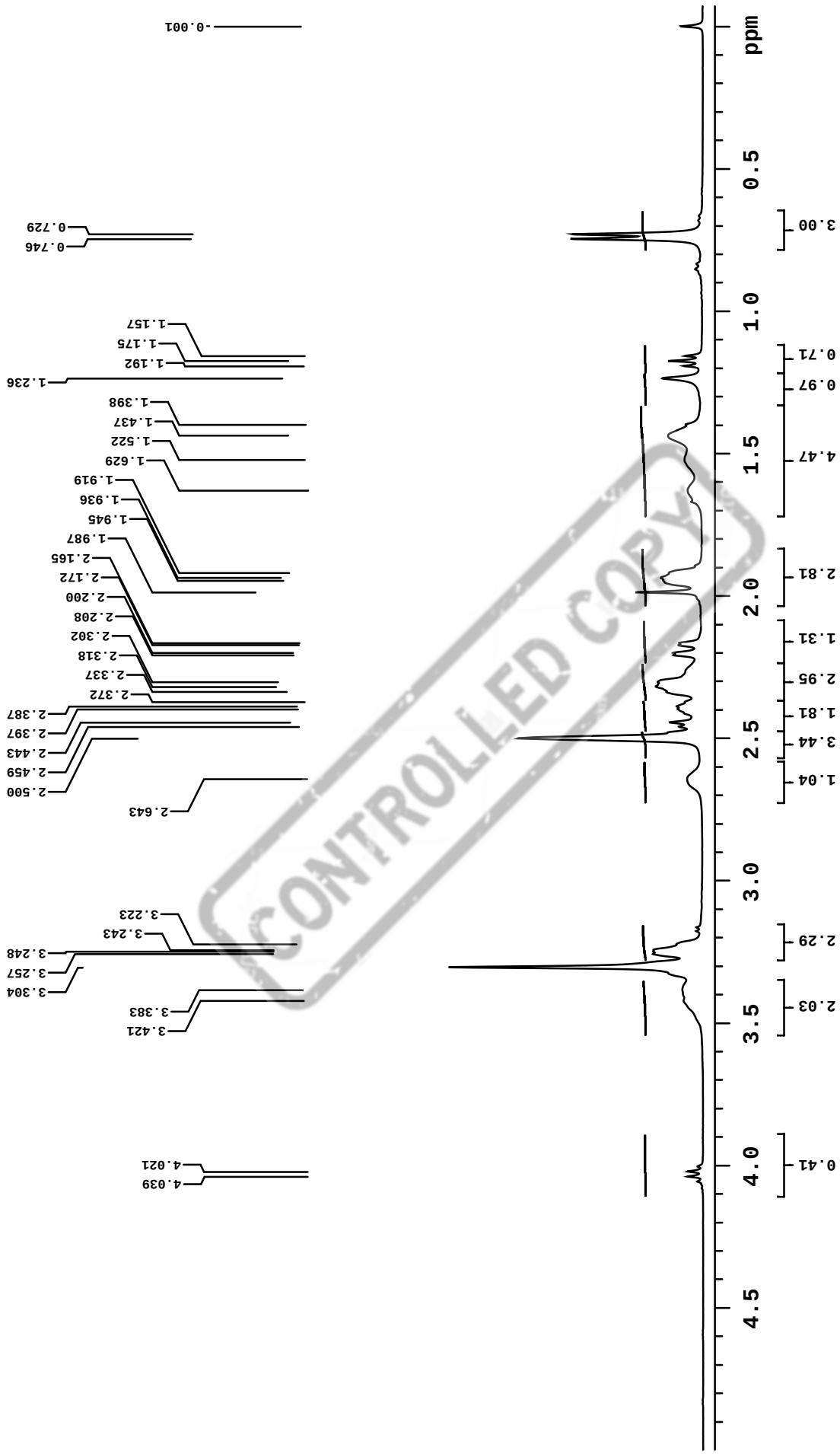
1H NMR spectrum of compound 10a in CDCl₃. The spectrum shows peaks from 0 to 8 ppm. Aromatic protons appear as a multiplet between 7.2 and 7.5 ppm. Aromatic protons appear as a multiplet between 3.2 and 3.9 ppm. Aromatic protons appear as a multiplet between 2.2 and 2.5 ppm. Aromatic protons appear as a multiplet between 1.1 and 1.4 ppm. Aromatic protons appear as a multiplet between 0.7 and 0.8 ppm. Integration values are shown below the peaks.

Chemical Shift (ppm)	Integration
7.434	0.05
7.415	0.05
7.397	0.05
7.377	0.05
7.367	0.05
7.348	0.05
7.335	0.05
7.318	0.05
7.298	0.05
7.262	0.05
7.244	0.05
7.226	0.05
7.207	0.05
7.189	0.05
4.039	0.05
4.021	0.05
3.821	0.05
3.83	0.05
3.804	0.05
3.257	0.05
3.248	0.05
3.243	0.05
3.223	0.05
2.643	0.05
2.500	0.05
2.459	0.05
2.443	0.05
2.397	0.05
2.387	0.05
2.372	0.05
2.337	0.05
2.318	0.05
2.302	0.05
2.208	0.05
2.200	0.05
2.172	0.05
2.165	0.05
1.987	0.05
1.945	0.05
1.936	0.05
1.919	0.05
1.629	0.05
1.522	0.05
1.437	0.05
1.398	0.05
1.236	0.05
1.192	0.05
1.175	0.05
1.157	0.05
0.746	0.05
0.729	0.05

Plotname: GS-DX0-02600-PROTON_01_plot01--

7.434
7.415
7.397
7.377
7.367
7.348
7.335
7.318
7.298
7.262
7.244
7.226
7.207
7.189







GS-DXO-025600

INTEGRAL VALUES

Integral	start(ppm)	end	value
1	16.0026	7.51563	-0.386
2	7.51563	7.28306	8.046
3	7.28306	7.28306	0.000
4	7.28306	7.10077	2.217
5	7.10077	4.10875	0.481
6	4.10875	3.88875	0.414
7	3.88875	3.54303	0.151
8	3.54303	3.34817	2.027
9	3.34817	3.27903	3.910
10	3.27903	3.15331	2.294
11	3.15331	2.72588	0.484
12	2.72588	2.58131	1.038
13	2.58131	2.56874	0.038
14	2.56874	2.47445	3.439
15	2.47445	2.47445	0.000
16	2.47445	2.36759	1.806
17	2.36759	2.36759	0.000
18	2.36759	2.23559	2.953
19	2.23559	2.23559	0.000
20	2.23559	2.08473	1.307
21	2.08473	2.03445	0.110
22	2.03445	1.8333	2.809
23	1.8333	1.72016	0.155
24	1.72016	1.33044	4.475
25	1.33044	1.33044	0.000
26	1.33044	1.2173	0.973
27	1.2173	1.2173	0.000
28	1.2173	1.11673	0.708
29	1.11673	0.783581	0.646
30	0.783581	0.645295	3.000
31	0.645295	-1.9628	0.945

PEAK FREQUENCIES

index	freq(ppm)	intensity
1	7.43387	11.9107
2	7.41522	17.1378
3	7.39658	9.24977
4	7.37684	21.5332
5	7.36697	15.6021
6	7.34833	15.9025
7	7.33517	12.6033
8	7.31763	15.8532
9	7.29789	8.88761
10	7.2617	5.53576
11	7.24416	7.20033
12	7.22552	7.93119
13	7.20687	7.65428
14	7.18933	3.35402
15	4.03883	2.76052
16	3.66912	2.79206

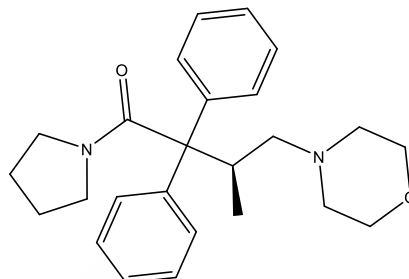
Plot name: GS-DXO-025600-PROTON_01_plot004

PEAK FREQUENCIES(CONTINUED)

index	freq(ppm)	intensity
17	3.42145	3.42137
18	3.38307	3.63173
19	3.30412	44.2732
20	3.25696	8.7802
21	3.24819	8.70691
22	3.24271	8.66584
23	3.22297	4.68259
24	2.64287	2.79841
25	2.50032	32.2729
26	2.45865	4.26001
27	2.4433	5.82858
28	2.39724	4.4631
29	2.38737	4.64397
30	2.37202	3.23103
31	2.33693	6.42412
32	2.31828	8.27017
33	2.30184	7.93471
34	2.20753	5.22104
35	2.19985	5.28725
36	2.17244	4.3096
37	2.16476	4.20486
38	1.98711	11.7991
39	1.94544	6.97649
40	1.93557	7.38422
41	1.91913	5.99078
42	1.62853	2.70977
43	1.52216	3.25441
44	1.43663	6.11371
45	1.39825	3.08682
46	1.23595	7.1389
47	1.19209	3.45096
48	1.17454	6.11537
49	1.157	3.22389
50	0.745777	23.0894
51	0.729328	22.7638
52	-0.000999339	3.9276

HNMR INTERPRETATION OF DEXTROMORAMIDE

Catalog Number : GS.83.DXO.00
CAS Number : 357-56-2
Batch Number : GS-DXO-02600
Mol.Wt : 392.53
Mol. Formula : C₂₅H₃₂N₂O₂



Dextromoramide;(3S)-3-Methyl-4-(morpholin-4-yl)-2,2-diphenyl-1-(pyrrolidin-1-yl)butan-1-one1-Butanone, 3-methyl-4-(4-morpholinyl)-2,2-diphenyl-1-(1-pyrrolidinyl)-, (3S)-; **357-56-2**; Metabolites, Impurities, Pharmaceutical Standards, Intermediates, Fine Chemicals, Steroids, Intermediates

SOLVENT USED: DMSO (d6)

δ 0.729-0.746 ppm (3H, d, -3CH), δ 1.157-1.629 ppm (5H, m, -5CH),
 δ 1.919-1.987 ppm (2H, dd, -2CH), δ 2.165-2.372 pm (4H, m, -4CH),
 δ 2.387-2.643 pm (4H, m, -4CH), δ 3.223-3.304 pm (2H, m, -2CH),
 δ 3.383-3.421 pm (2H, m, -2CH), δ 7.189-7.298 pm (2H, m, -Ar-CH),
 δ 7.318-7.434 pm (8H, m, -Ar-CH),

Checked By

Approved By

GS-DXO-02600-3

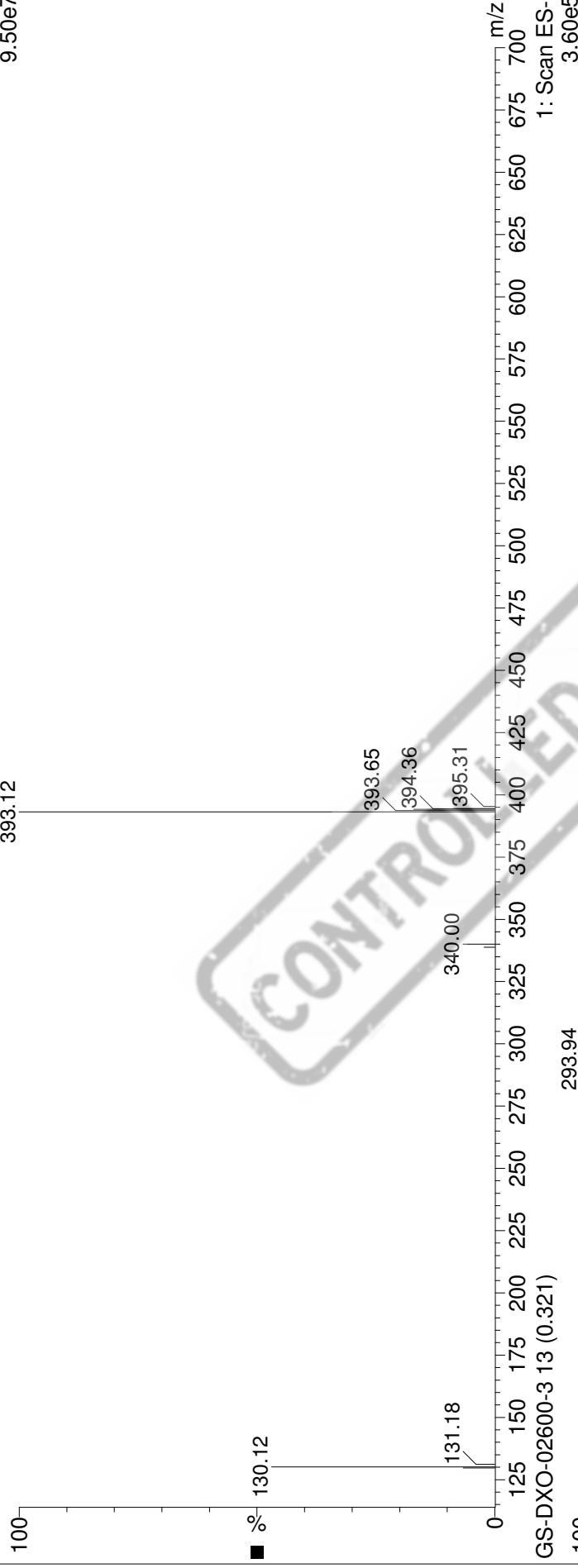
20-Mar-2026

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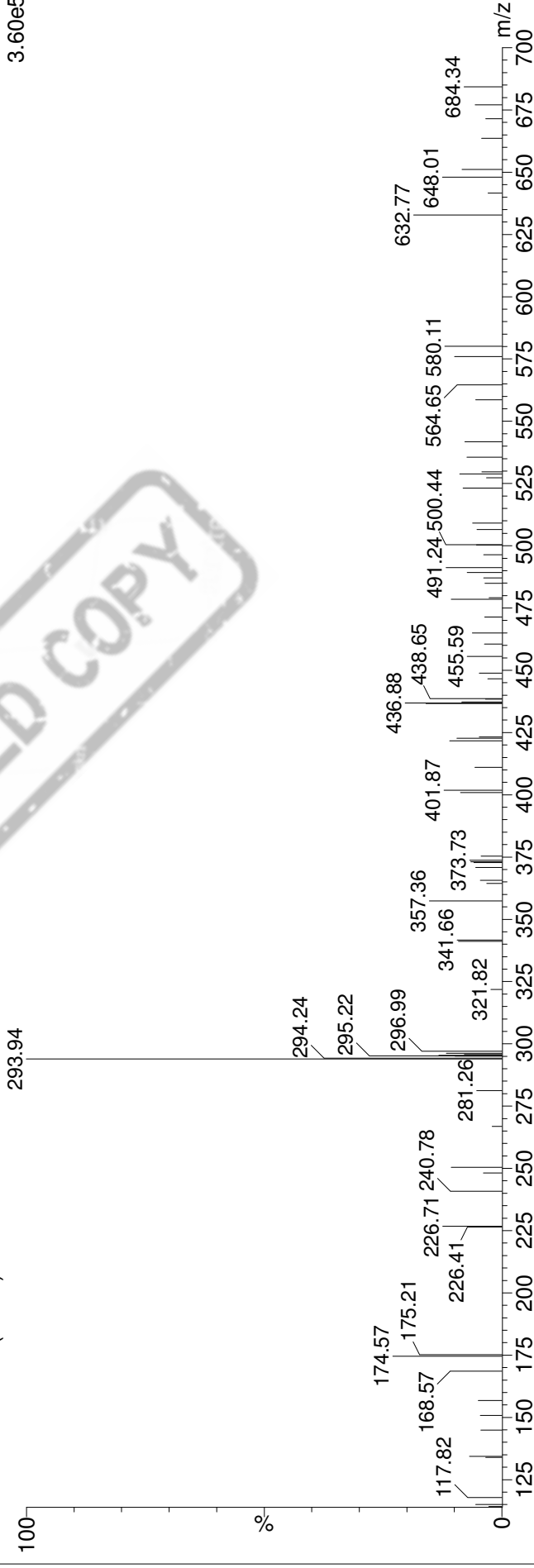
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9.50e7

GS-DXO-02600-3 16 (0.417)

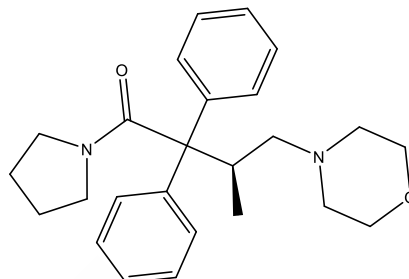


GS-DXO-02600-3 13 (0.321)



MASS INTERPRETATION OF DEXTROMORAMIDE

Catalog Number : GS.83.DXO.00
CAS Number : 357-56-2
Batch Number : GS-DXO-02600
Mol.Wt : 392.53
Mol. Formula : C₂₅H₃₂N₂O₂



Dextromoramide ; (3S)-3-Methyl-4-(morpholin-4-yl)-2,2-diphenyl-1-(pyrrolidin-1-yl)butan-1-one
Butanone, 3-methyl-4-(4-morpholinyl)-2,2-diphenyl-1-(1-pyrrolidinyl)-, (3S)-; **357-56-2**; Metabolites, Impurities, Pharmaceutical Standards, Intermediates, Fine Chemicals, Steroids, Intermediates

m/z	fragments
393.12 (+ve mode)	[M+1]

The molecular mass of **Dextromoramide (392.53)** has been confirmed with fragments appearing [M+1] 393.12 in positive mode. The signals of the Mass spectrum and their interpretation are consistent with the structural formula.

Checked By

Approved By

Final Results: (Dextromoramide)

1. Chromatographic purity (HPLC) : **96.12%**
2. Residual solvents : No significant amounts of residual solvents were detected (< 0.2 %).
3. Assay : (100 % method) **96.12%**. The assay is assessed to be **96.12%** 'as is' The assay 'as is' is equivalent to the assay based on the not anhydrous and not dried substance respectively.
4. Release Date : 30.03.2026
5. Place : Salem, Tamilnadu