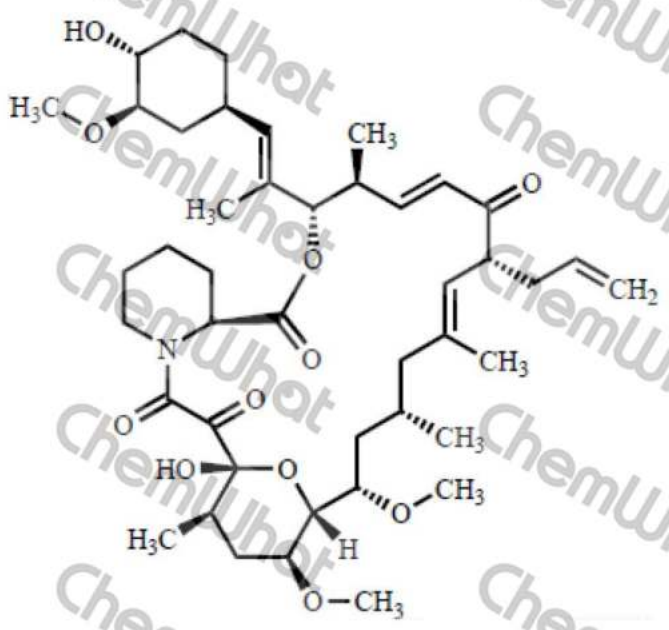


CERTIFICATE OF ANALYSIS (COA)

PRODUCT NAME	Tacrolimus C4-epimer Diene	 <p>The image shows the chemical structure of Tacrolimus C4-epimer Diene. It is a complex polycyclic molecule with multiple stereocenters, hydroxyl groups, and a diene system. The structure is drawn in a perspective view, showing the spatial arrangement of atoms and functional groups.</p>
PRODUCT NUMBER	1398979	
CAS NUMBER	104987-11-334	
MOLECULAR FORMULA	C ₄₄ H ₆₇ NO ₁₁	
MOLECULAR WEIGHT	786.02	
BATCH NUMBER	WI22031503	
QUANTITY	10mg	
PRODUCTION DATE	2022.03.15	
RETEST DATE	2025.03.14	
STANDARD	Enterprise Standard	

TEST ITEMS	SPECIFICATIONS
APPEARANCE	Off white Solid
PURITY	≥80%
% Potency = [Chromatographic Purity % - TGA Value %] = [90.46 - 1.457] = 89.00%	
CONCLUSION	Analyzed, this product complies with Enterprise Standard
STORAGE	Store at 2~8 °C for long time, sealed and away from light.

ChemWhat

High-quality Analytical Reagents

Series: **AKS**

Website: www.chemwhat.com

Email: contact@chemwhat.com

Watson International Ltd (Limited)

For bulk materials, please visit www.watson-int.com

"ChemWhat" has been acquired by Watson and is now acting as a sub-brand under Watson International. WATSON INTERNATIONAL warrants material of said quality at the time of sale. It is the sole responsibility of the customers to determine the adequacy of all materials for any intended or specific purpose or use. WATSON's sole obligation is to replace the material up to the extent of the purchase price. This warranty applies only to products in original packaging and does not apply to a product which has been tampered with or altered in any way or which has been misused or damaged by accident or negligence. All claims must be received in writing (by fax or email) within 30 days from date when product arrive at the destination city and failure to do so shall constitute a waiver by customers for any and all such claims.

ANALYZER

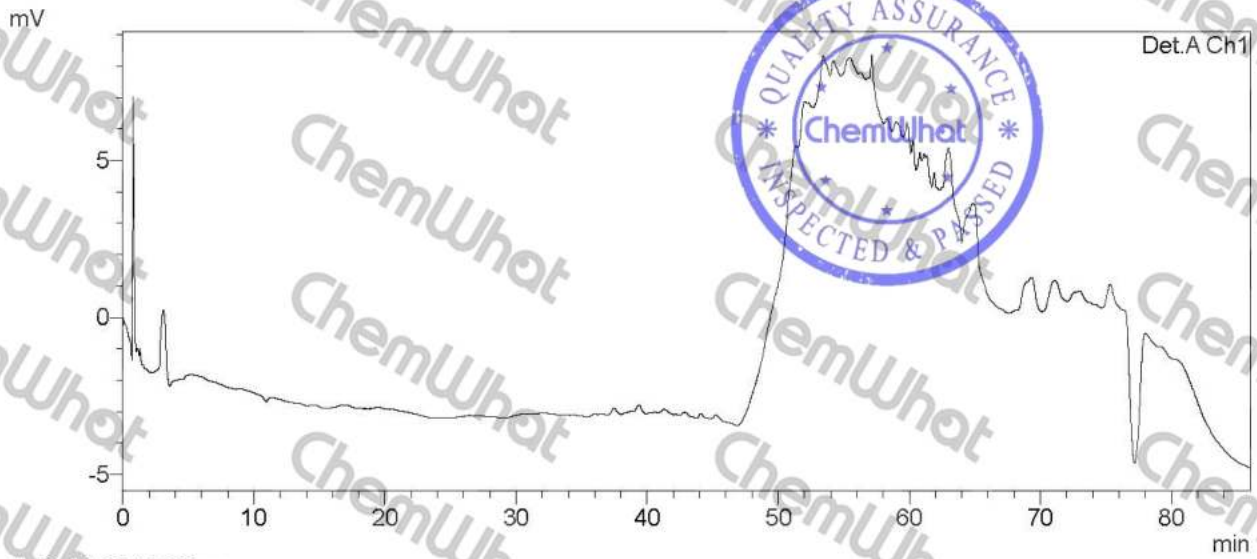


SUPERVISOR



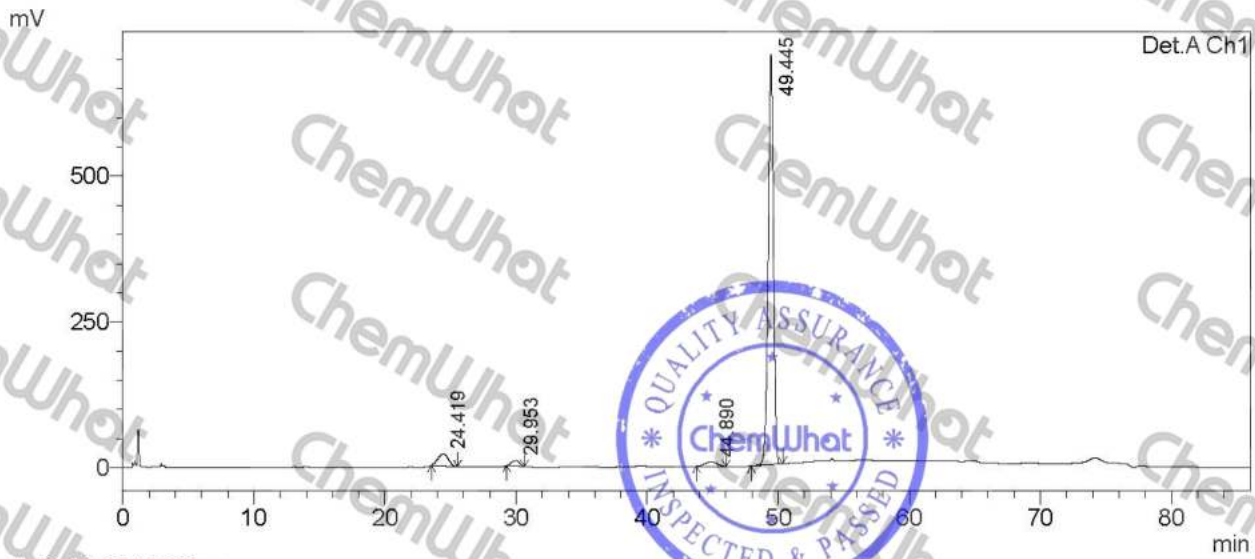
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Sample Name : BLANK
Sample ID : BLANK
Tray# : 1
Vial # : 1
Injection Volume : 40 uL
Data File Name : BLANK.lcd
Method File Name : TACROLIMUS.lcm
Batch File Name : TACROLIMUS.lcb
Report File Name : Default.lcr
Data Acquired : 6/19/2022 3:36:30 PM
Data Processed : 6/19/2022 5:02:32 PM

<Chromatogram>



Acquired by : Admin
 Sample Name : AK15
 Sample ID : AK15
 Tray# : 1
 Vial # : 4
 Injection Volume : 40 uL
 Data File Name : AK15.lcd
 Method File Name : TACROLIMUS.lcm
 Batch File Name : TACROLIMUS.lcb
 Report File Name : Default.lcr
 Data Acquired : 6/19/2022 7:56:12 PM
 Data Processed : 6/19/2022 9:22:16 PM

<Chromatogram>



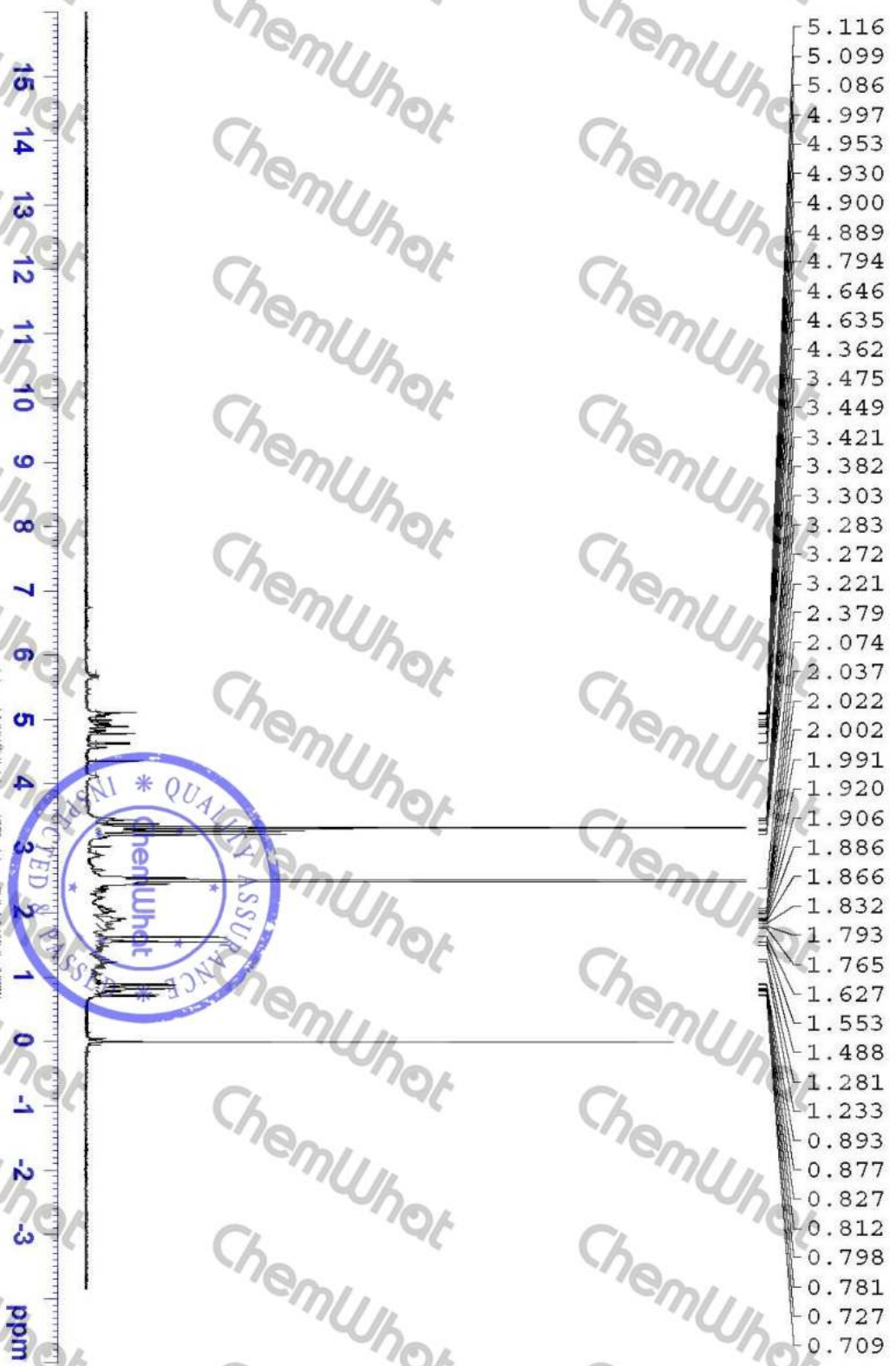
1 Det.A Ch1/220nm

PeakTable

Detector A Ch1 220nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	24.419	1136819	20773	5.257	2.805
2	29.953	402739	9650	1.862	1.303
3	44.890	523278	7870	2.420	1.063
4	49.445	19563195	702222	90.461	94.829
Total		21626031	740516	100.000	100.000

AK10
 1H-NMR / DMSO
 25-MAR-2022



1.10
 3.24
 2.08
 1.72
 1.10
 1.06
 1.27
 0.99
 0.88
 1.17
 2.86
 1.02
 1.22
 3.97
 4.26
 3.10
 1.82
 1.06
 2.09
 5.04
 5.02
 4.24
 3.34
 3.17
 2.82
 5.22
 1.26
 1.08
 3.06
 3.00
 1.87
 2.94

5.116
 5.099
 5.086
 4.997
 4.953
 4.930
 4.900
 4.889
 4.794
 4.646
 4.635
 4.362
 3.475
 3.449
 3.421
 3.382
 3.303
 3.283
 3.272
 3.221
 2.379
 2.074
 2.037
 2.022
 2.002
 1.991
 1.920
 1.906
 1.886
 1.866
 1.832
 1.793
 1.765
 1.627
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 0.709

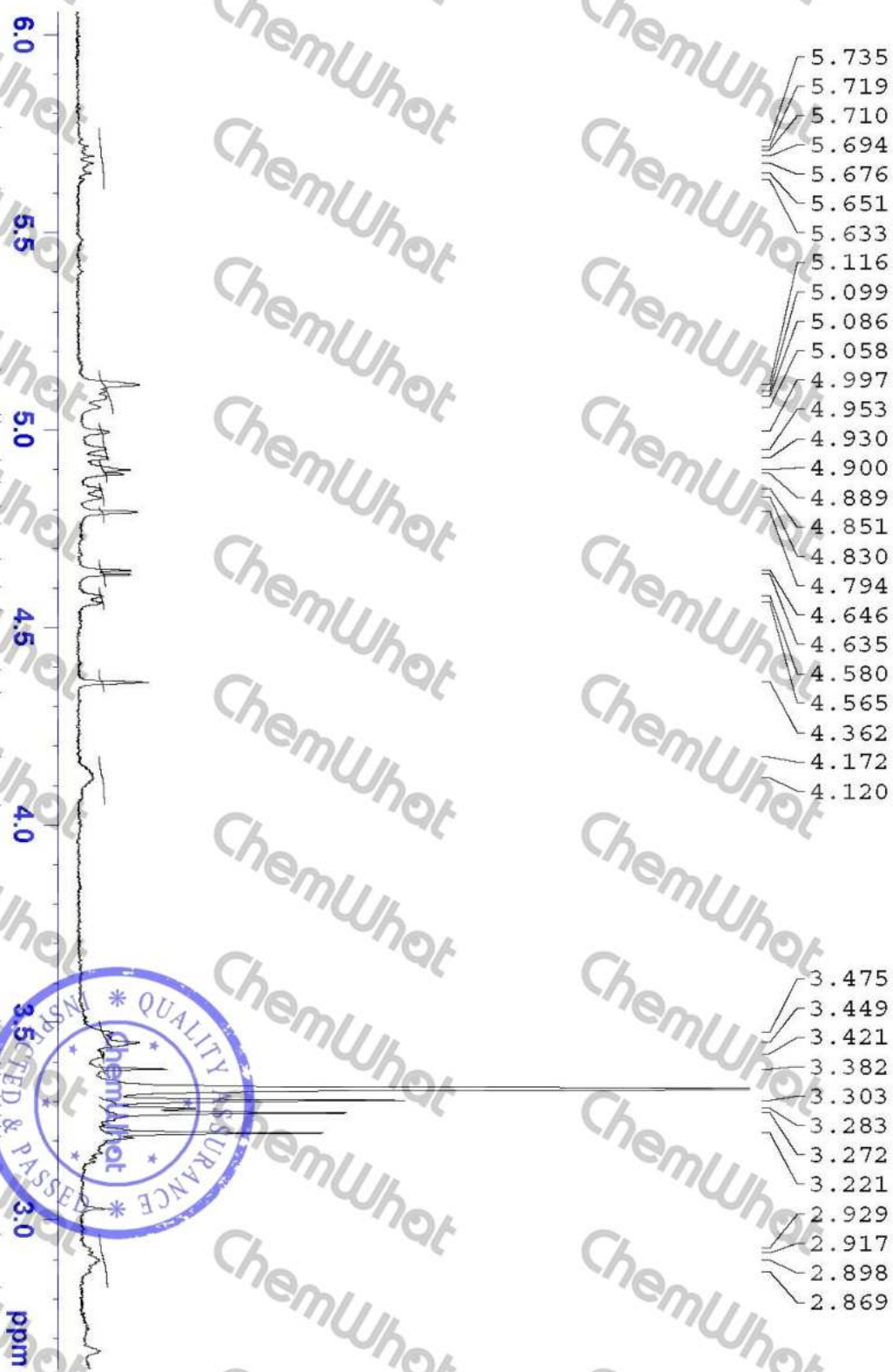
Current Data Parameters
 NAME 220325024
 EXPNO 1
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20220325
 Time 13.28 h
 INSTRUM spect
 PROBHD Z108618_0828 (2930
 PULPROG 65536
 TD 16
 SOLVENT DMSO
 NS 16
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.244532 Hz
 AQ 4.0894465 sec
 RG 195.98
 DW 62.400 usec
 DE 16.75 usec
 TE 0 K
 D1 1.00000000 sec

F2 - Processing parameters
 SI 65536
 SF 400.0890050 MHz
 WDM 0
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



AK10
 1H-NMR / DMSO
 25-MAR-2022



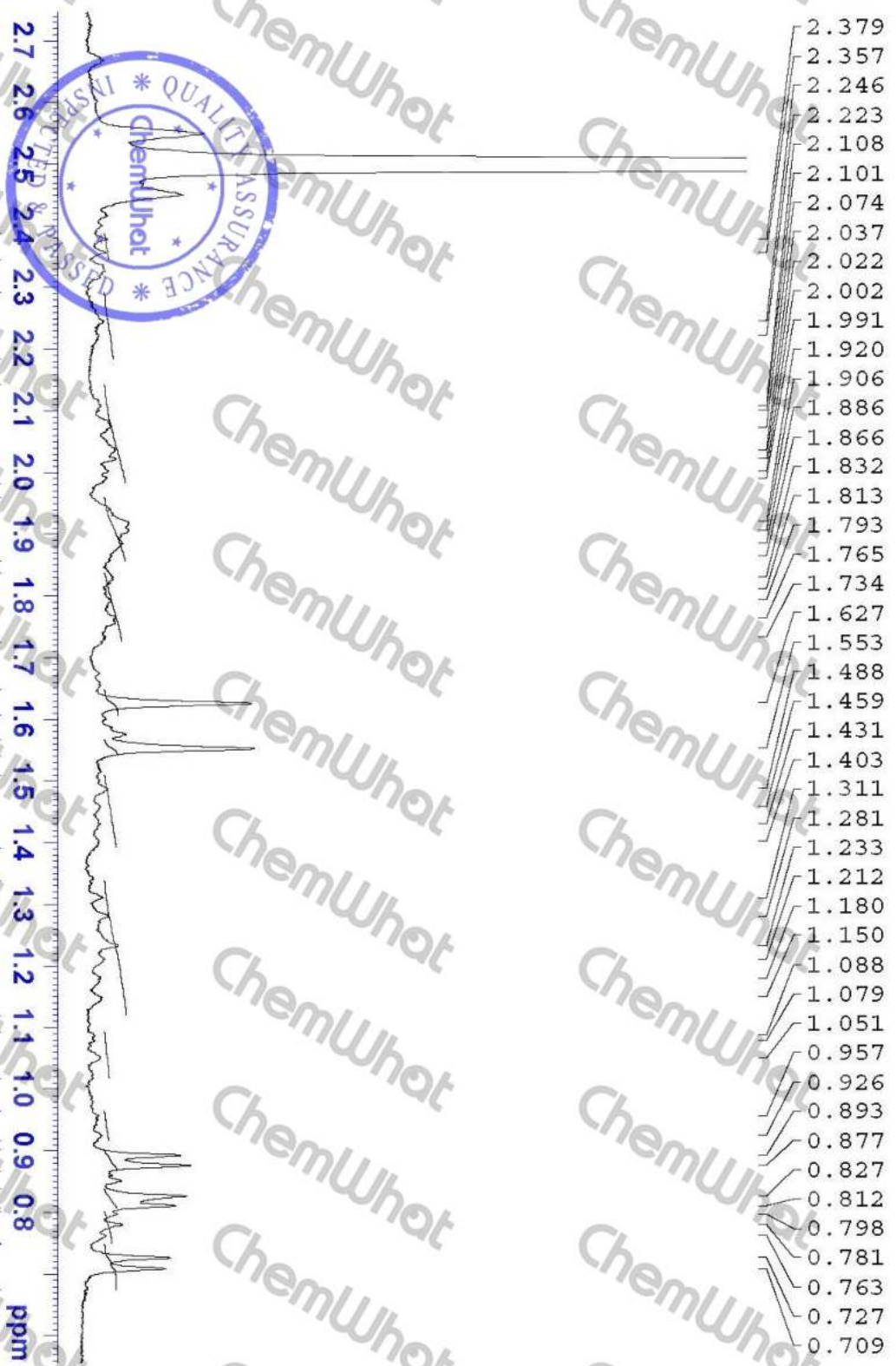
Current Data Parameters
 NAME 220325024
 EXPNO 1
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20220325
 Time 13.28 h
 INSTRUM spect
 PROBHD Z108618_0828 (2930
 PULPROG 65536
 TD 16
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 NS 16
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.244532 Hz
 AQ 4.0894465 sec
 RG 195.98
 DW 62.400 usec
 DE 16.75 usec
 TE 0 K
 D1 1.00000000 sec
 TD0 1
 SF01 400.0904705 MHz
 NUC1 1H
 P0 5.33 usec
 P1 16.00 usec
 P1M1 11.39700031 W

F2 - Processing parameters
 SI 65536
 SF 400.0880050 MHz
 MDM 0
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



AK10
 1H-NMR / DMSO
 25-MAR-2022



Current Data Parameters
 NAME 220325024
 EXPNO 1
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20220325
 Time 13.28 h
 INSTRUM spect
 PROBHD Z108618_0828 (2930
 PULPROG 65536
 TD 65536
 SOLVENT DMSO
 NS 16
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.244532 Hz
 AQ 4.0894465 sec
 RG 195.98
 DW 62.400 usec
 DE 16.75 usec
 TE 0 K
 D1 1.00000000 sec
 TD0 1
 SF01 400.0904705 MHz
 NUC1 1H
 P0 5.33 usec
 P1 16.00 usec
 PL1 11.39700031 W

F2 - Processing parameters
 SI 65536
 SF 400.0880050 MHz
 WDM 0
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



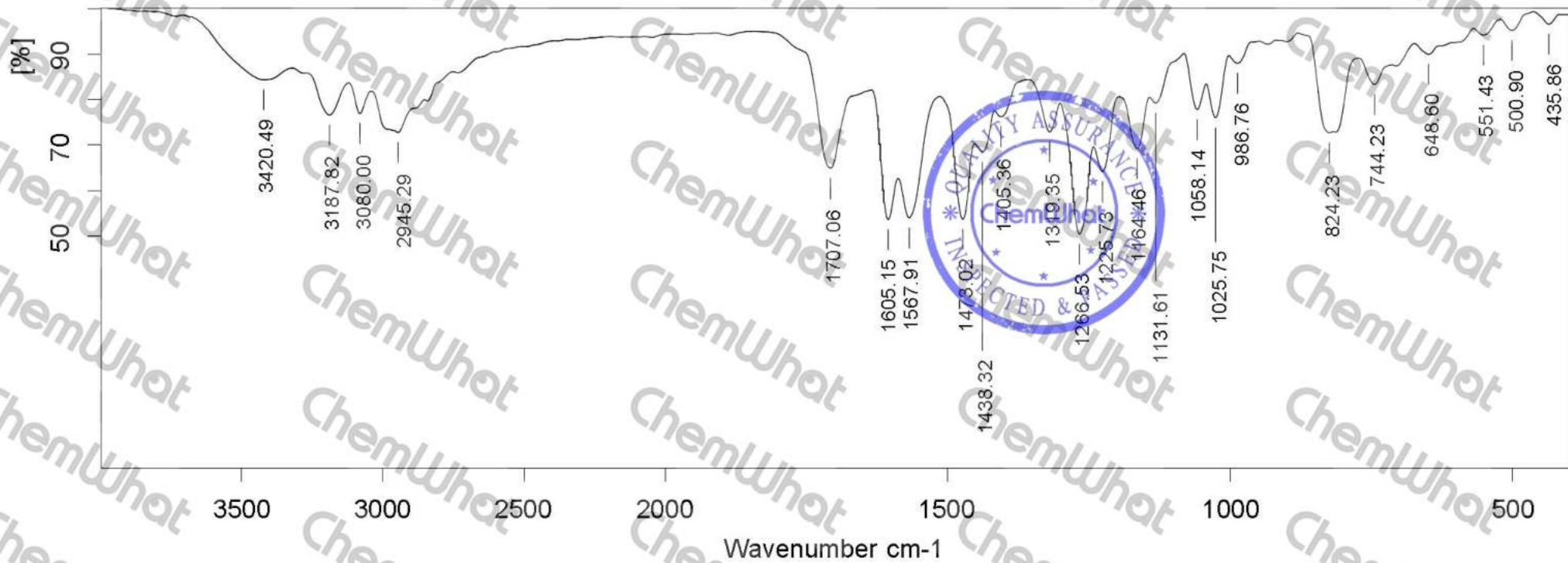
Sample Name : AK10

```

=====
Acq. Operator   : SYSTEM                      Seq. Line :   10
Acq. Instrument : ALR-QC-LCMS                 Location  :   10
Injection Date  : 3/18/2022 2:23:18 PM       Inj       :    1
                                                Inj Volume: 10.000 µl
Acq. Method     : D:\data_ms\MAR-2022\18-03-2022-001 2022-03-18 13-46-10\MASS FA.M
Last changed    : 3/18/2022 1:46:10 PM by SYSTEM
Analysis Method : C:\CHEM32\1\METHODS\MASS FA..M
Last changed    : 3/18/2022 2:43:35 PM by SYSTEM
                  (modified after loading)
Method Info     : Mobile phase: Mobile Phase:1ml of Formic Acid in 1000ml Water:ACN (50:50
                  ) Flow:0.5 mlFragmentor-110
Sample Info     : Diluent:Methanol           Expected Mass:100-1200
  
```

MS Spectrum





Sample Name: ALL -T03326

Lot No./BatchNo: AK10

Date & Time: 21-03-2022, 18:44:53

Operator Name: Admin

Analysed by:
Date:

Experiment: USP.XPM

Resolution: 4

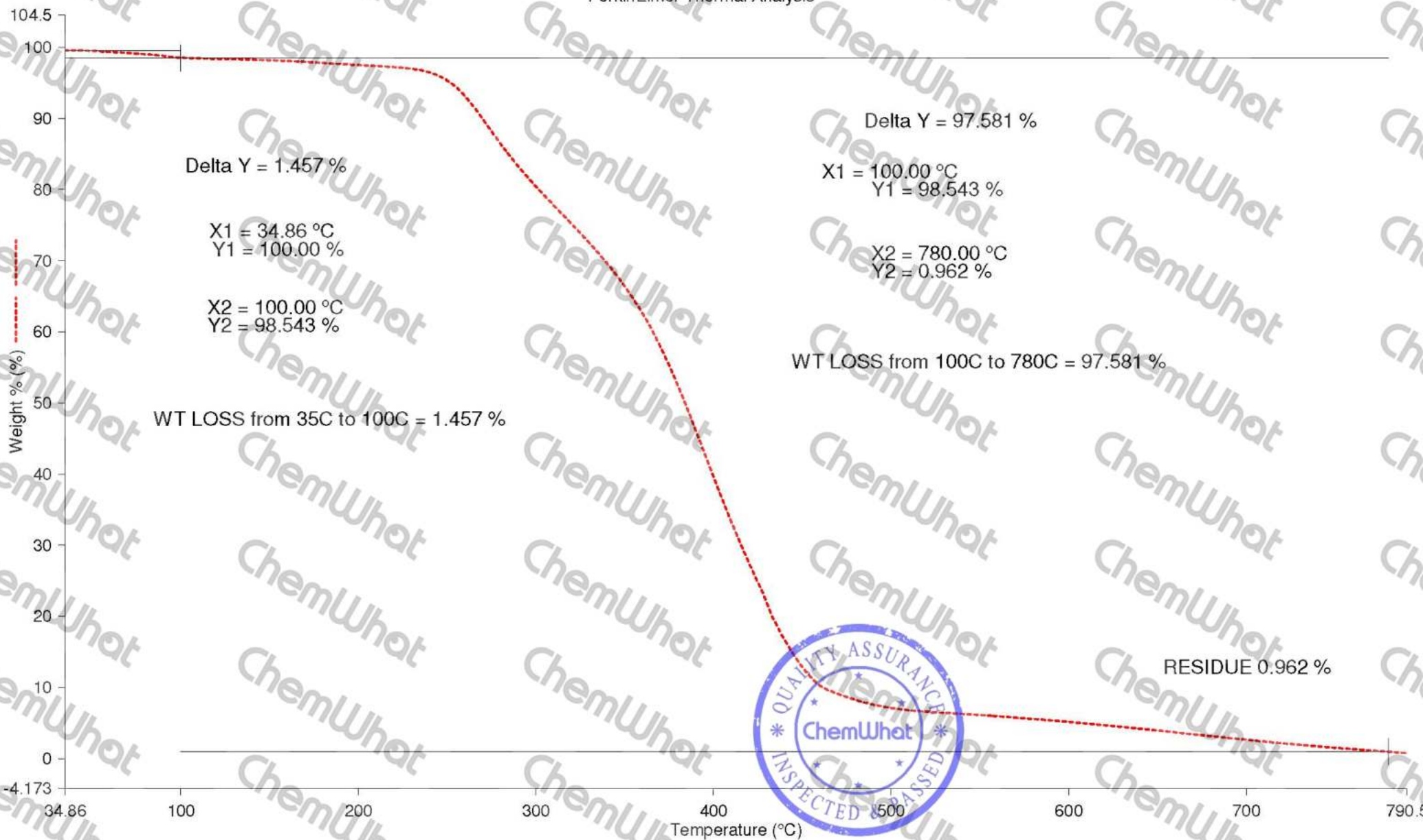
Sample Scans: 16

Frequency Range: 4000 to 400

Checked by:
Date:

Filename: D:\TGA Data\AK10.t6d
Operator ID:
Sample ID: AK10
Sample Weight: 7.438 mg
Comment:

PerkinElmer Thermal Analysis



21/03/2022 2:33:46 PM

1) Heat from 35.00°C to 800.00°C at 20.00°C/min