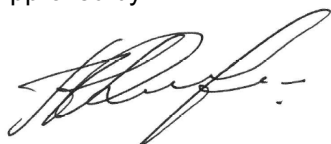


Name:	Formoterol-D6 (major) Fumarate (Mixture of Diastereomers)
Lot#:	GR-19-169
Test Date:	08/19/2024 (re-test date: 08/19/2029)
CAS No.:	43229-80-7 (unlabeled)
MF:	C ₄₂ H ₄₀ D ₁₂ N ₄ O ₁₂
MW:	816.96
Appearance:	Beige Solid
Purity:	95.9% by HPLC (average of two sample preparations); >98% atom D
¹H-NMR:	Conforms (shows a trace of IPA and DCM)
MS-ESI (+)	Conforms (shows peak at m/z = 351.22 [M _{(free base)+H}] ⁺)
Storage	Store at -18°C in a dry place away from direct sunlight

Approved by:

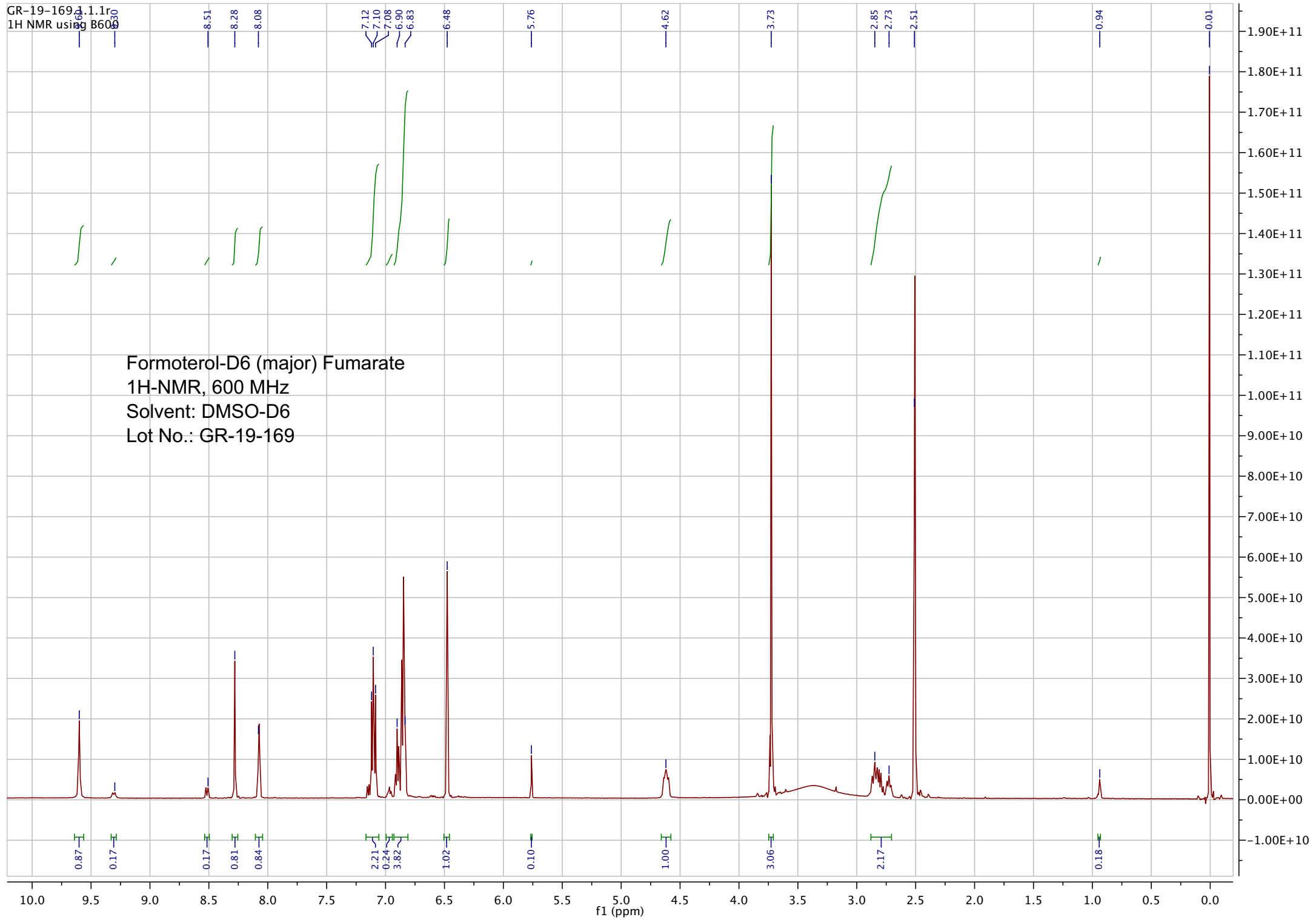
Date: 08/19/2024



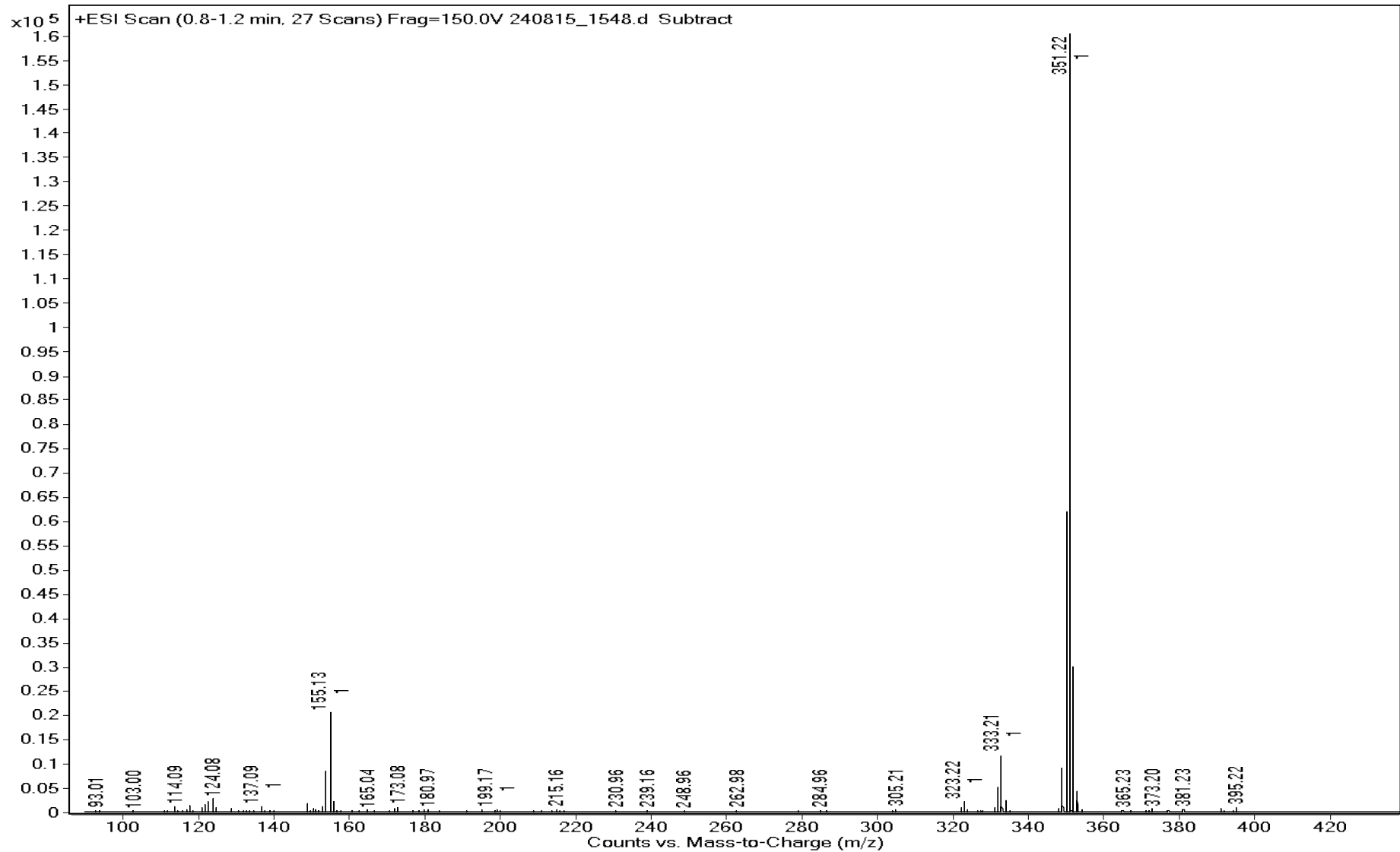
Viorica Rusu, QC/QA Manager

GR-19-169.1.1r
1H NMR using B600

Formoterol-D6 (major) Fumarate
1H-NMR, 600 MHz
Solvent: DMSO-D6
Lot No.: GR-19-169



Sample Name	GR-19-169	Data File	240815_1548.d	Acq Method	HRMS.m
DA Method	AIMS_Accurate_Mass.m	Instrument	Agilent 6538 UHD	Acq Date, Time	15/08/2024 10:51:54 AM
Comment	ESI+				



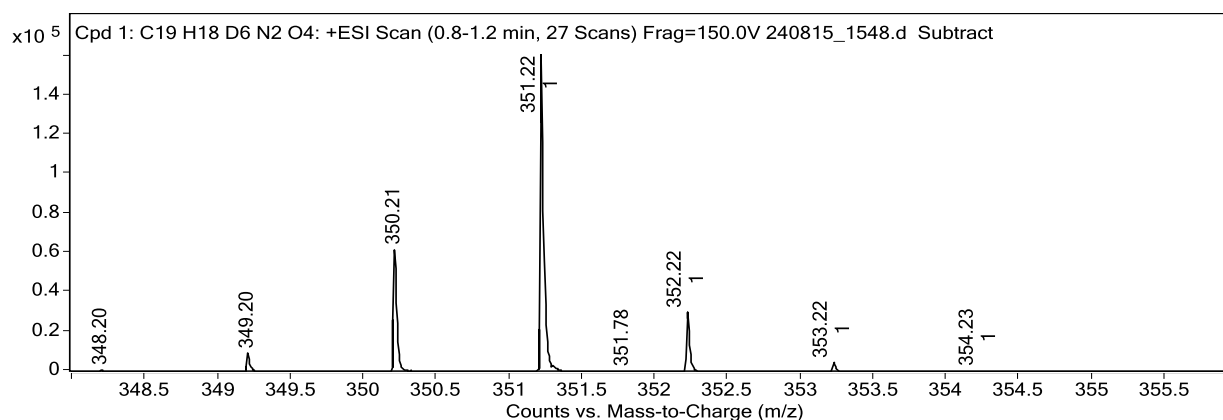
Sample Name	GR-19-169	Data File	240815_1548.d
Acq Method	HRMS.m	DA Method	AIMS_Accurate_Mass.m
Instrument	Agilent 6538 UHD	Acq Date, Time	15/08/2024 10:51:54 AM
Comment	ESI+		

Target Ion Species

Ion Species	m/z	Ionic Formula
(M+H) ⁺	351.22	C ₁₉ H ₁₉ D ₆ N ₂ O ₄

MFG Calculator Results

Target m/z	Ionic Formula	Calc m/z	+/- (mDa)	+/- (ppm)	DBE	MFG Score
351.2200	C ₁₉ H ₁₉ D ₆ N ₂ O ₄	351.2200	0.0	0.0	9.0	96.81
351.2200	C ₁₅ H ₁₅ D ₆ N ₈ O ₂	351.2200	0.0	0.0	10.0	87.38
351.2200	C ₂₀ H ₁₅ D ₆ N ₆	351.2200	0.0	0.0	14.0	84.49
351.2200	C ₁₄ H ₁₉ D ₆ N ₄ O ₆	351.2100	10.0	28.5	5.0	74.16



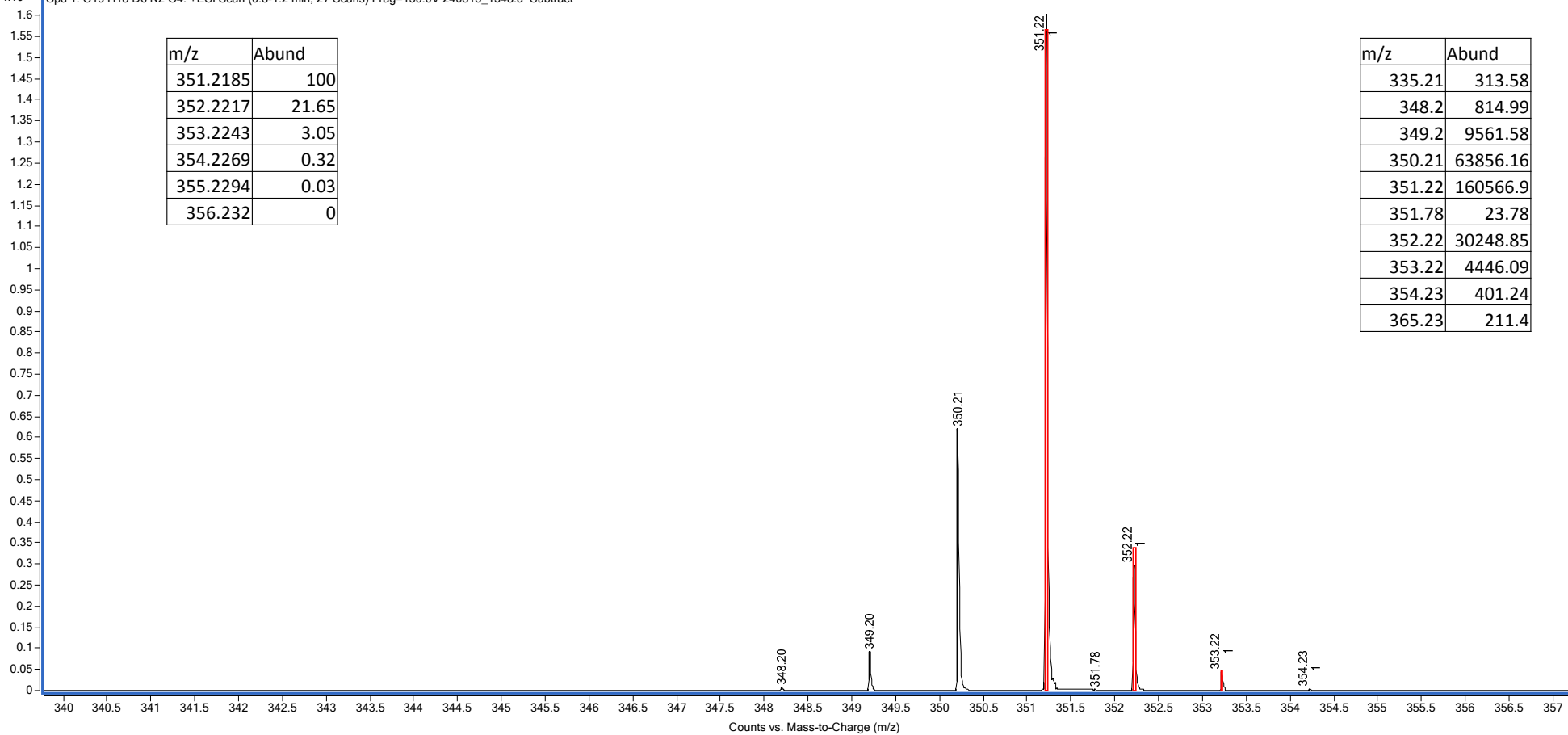
Predicted Isotope Match Table

Isotope	m/z	Calc m/z	Diff (mDa)	Abund (%)	Calc Abund (%)	+/-
1	351.2200	351.2200	0.0	100.0	100.0	0.0
2	352.2200	352.2200	0.0	18.8	21.7	2.9
3	353.2200	353.2200	0.0	2.8	3.1	0.3

x10⁵ Cpd 1: C19 H18 D6 N2 O4: +ESI Scan (0.8-1.2 min, 27 Scans) Frag=150.0V 240815_1548.d Subtract

m/z	Abund
351.2185	100
352.2217	21.65
353.2243	3.05
354.2269	0.32
355.2294	0.03
356.232	0

m/z	Abund
335.21	313.58
348.2	814.99
349.2	9561.58
350.21	63856.16
351.22	160566.9
351.78	23.78
352.22	30248.85
353.22	4446.09
354.23	401.24
365.23	211.4

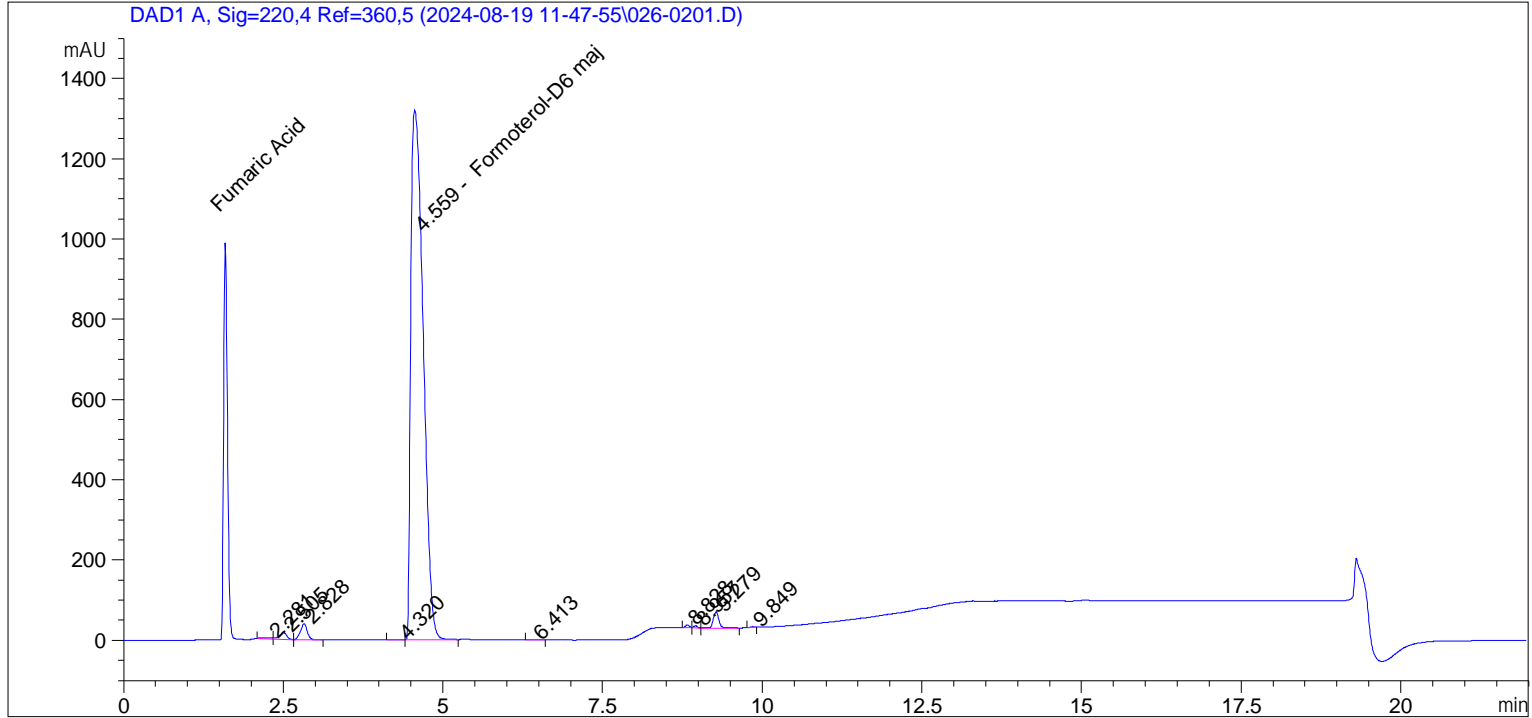


Sample Name: GR-19-169

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=====
Acq. Operator   : vrusu                               Seq. Line :    2
Acq. Instrument : Instrument 1                         Location  : Vial 26
Injection Date  : 8/19/2024 12:12:30 PM              Inj       :    1
                                                    Inj Volume: 5.0 µl
Different Inj Volume from Sequence !   Actual Inj Volume : 10.0 µl
Acq. Method    : C:\CHEM32\1\DATA\2024-08-19 11-47-55\VR081924_169.M
Last changed   : 8/19/2024 11:44:21 AM by vrusu
Analysis Method: C:\CHEM32\1\METHODS\VR081924_169PM.M
Last changed   : 8/19/2024 2:40:17 PM by vrusu
=====

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=====
                          Area Percent Report
=====

```

```

Sorted By           :      Signal
Calib. Data Modified :      8/19/2024 2:39:53 PM
Multiplier:         :      1.603e3
Dilution:           :      1.0000
Use Multiplier & Dilution Factor with ISTDs

```

Signal 1: DAD1 A, Sig=220,4 Ref=360,5

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Area %	Name
1	2.281	BV	0.1358	25.36146	0.1372	?
2	2.505	VB	0.1111	136.12517	0.7363	?
3	2.828	BB	0.1069	293.80576	1.5893	?
4	4.320	BB	0.1014	4.14686	0.0224	?
5	4.559	BB	0.2207	1.77136e4	95.8173	Formoterol-D6 maj
6	6.413	BB	0.1154	10.11105	0.0547	?
7	8.828	BV	0.0635	29.12011	0.1575	?
8	8.957	VB	0.0608	20.76436	0.1123	?
9	9.279	BB	0.0955	245.73846	1.3293	?
10	9.849	BB	0.0655	8.08787	0.0437	?

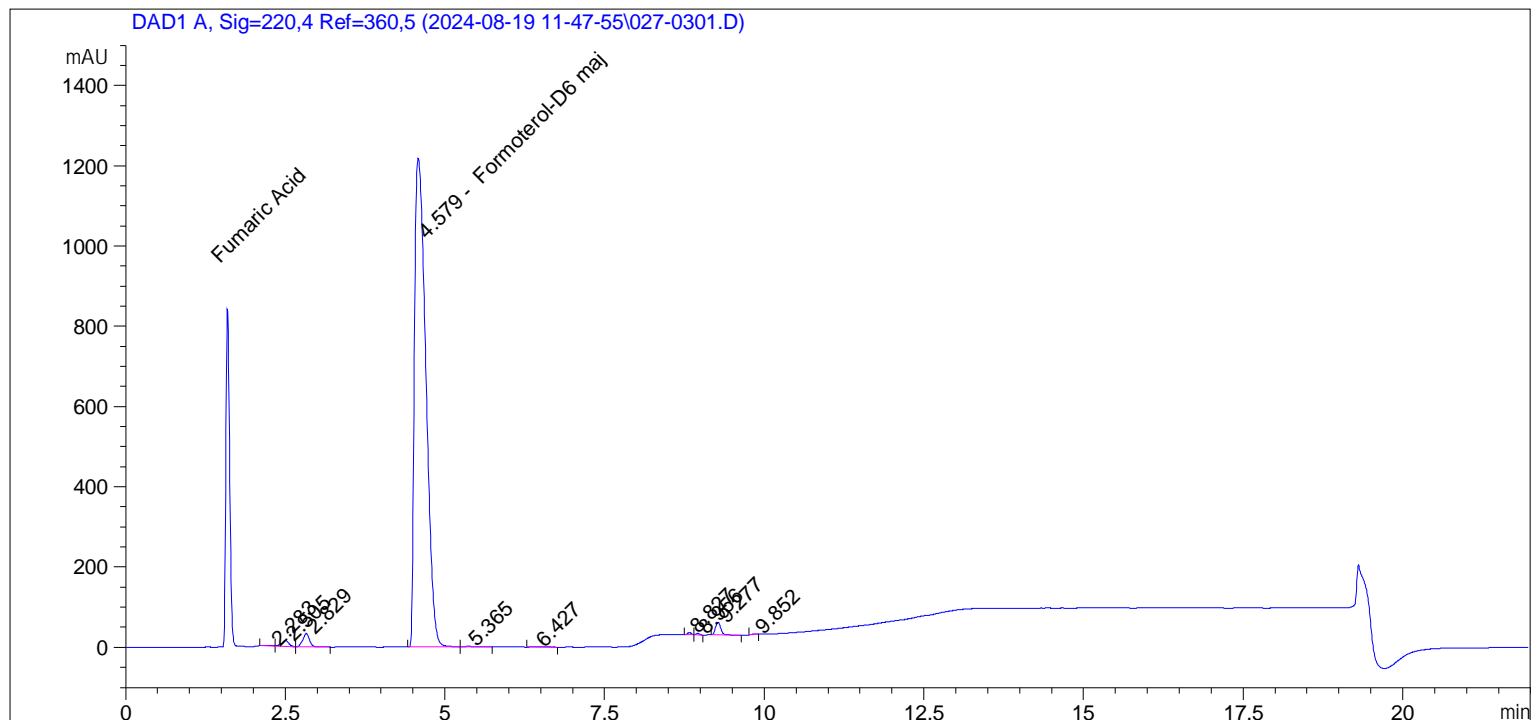
Sample Name: GR-19-169

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Area %	Name
Totals :				1.84869e4		

=====
*** End of Report ***

```

=====
Acq. Operator   : vrusu                               Seq. Line :    3
Acq. Instrument : Instrument 1                         Location  : Vial 27
Injection Date  : 8/19/2024 12:35:54 PM              Inj       :    1
                                                    Inj Volume: 5.0 µl
Different Inj Volume from Sequence !   Actual Inj Volume : 10.0 µl
Acq. Method    : C:\CHEM32\1\DATA\2024-08-19 11-47-55\VR081924_169.M
Last changed   : 8/19/2024 11:44:21 AM by vrusu
Analysis Method: C:\CHEM32\1\METHODS\VR081924_169PM.M
Last changed   : 8/19/2024 2:40:17 PM by vrusu
  
```



=====
 Area Percent Report
 =====

```

Sorted By           :      Signal
Calib. Data Modified :      8/19/2024 2:39:53 PM
Multiplier:         :      1.603e3
Dilution:           :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: DAD1 A, Sig=220,4 Ref=360,5

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Area %	Name
1	2.283	BV	0.1337	18.85669	0.1201	?
2	2.505	VB	0.1092	114.07579	0.7263	?
3	2.829	BB	0.1068	242.38983	1.5432	?
4	4.579	BV	0.2023	1.50735e4	95.9668	Formoterol-D6 maj
5	5.365	VB	0.1822	20.15706	0.1283	?
6	6.427	BB	0.1499	10.73933	0.0684	?
7	8.827	BV	0.0623	22.82878	0.1453	?
8	8.956	VB	0.0602	16.26348	0.1035	?
9	9.277	BB	0.0908	182.01427	1.1588	?
10	9.852	BB	0.0680	6.16418	0.0392	?

Sample Name: GR-19-169 spl-2

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Area %	Name
----- ----- ----- ----- ----- ----- -----				Totals :	1.57070e4	

=====
*** End of Report ***