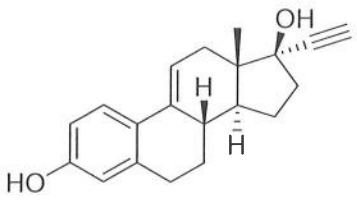
DALTON
Pharma Services
Accelerated Drug Discovery And Development

Certificate of Analysis

Name of Product:		Lot Number:
delta-9(11)-Ethynylestradiol *(delta-9(11)-EE; Ethynylestradiol EP imp B)*		VB-48-31-062022
Manufacture Date: 06/20/22	**Retested On:** n/a	**Next Retest Date:** 06/19/25

Recommended Storage Conditions:

☐ Ambient atmosphere ☒ Inert atmosphere
☐ Ambient temperature ☒ 2-8°C (refrigeration) ☐ -20°C or below (freezer)

Structure:	Molecular Formula:
	$C_{20}H_{22}O_2$
	Molecular Weight: 294.39
	CAS Number: 1231-96-5

Appearance: White solid

Identity: ^{1}H-NMR - conforms to structure

MS(ESI+ve): $[M+H]^+$ = 295.0 - conforms to structure

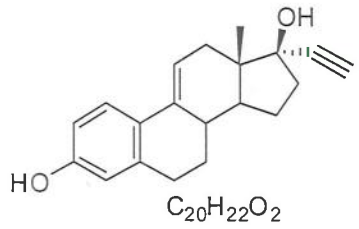
Purity (by LC/MS): 98.6 % by AUC at 254nm

Dalton Pharma Services hereby certifies that the above information is authentic and accurate.

Zemin Li, R&D Chemistry Supervisor	Date: 06/28/22

349 Wildcat Rd., Toronto, ON M3J 2S3 • Tel: 416-661-2102 • 1-800-567-5060 • Fax: 416-661-2108
www.dalton.com

VB-48-31, 1H-NMR, DMSO-d6, 06/20/22



$C_{20}H_{22}O_2$

VB
06/27/22

9.232 | 7.433 | 7.411 | 6.539 | 6.517 | 6.442 | 6.082 | 5.432 | 3.336 | 2.659 | 2.500 | 2.115 | 2.105 | 1.940 | 1.397 | 1.192 | 0.758

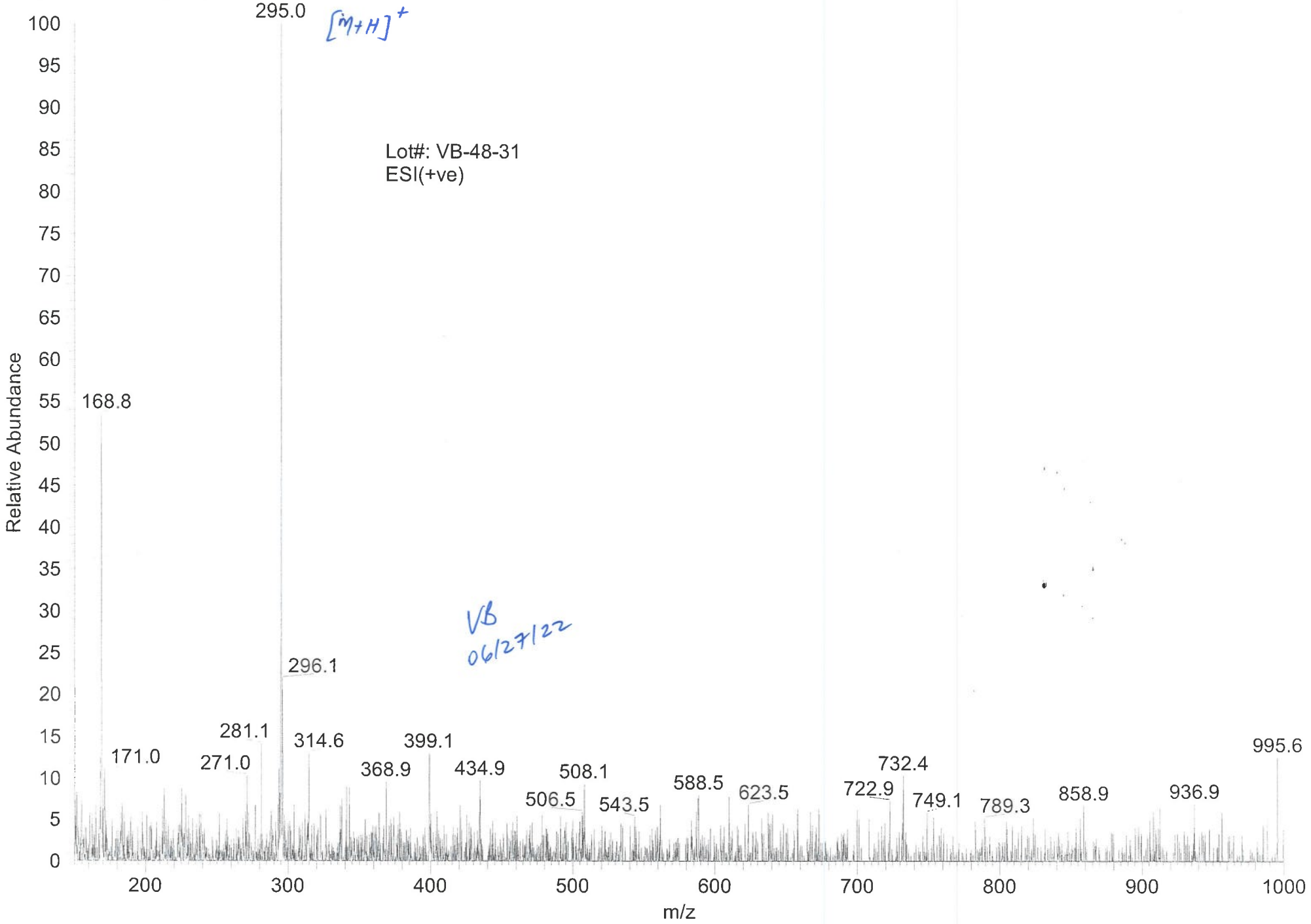
1.0 | 1.0 | 1.8 | 1.0 | 1.0 | 1.0 | 3.0 | 1.0 | 4.0 | 1.8 | 1.0 | 1.0 | 3.0

10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0

ppm (t1)

C:\Dalton\data\062022\VB-48-31 6/20/2022 9:24:29 AM

VB-48-31 #180-184 RT: 5.04-5.15 AV: 5 NL: 8.73E5
T: + p ESI Full ms [50.00-2000.00]



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==========================================================================
Injection Date  : 6/23/2022 12:30:36 PM          Seq. Line :   3
Sample Name     : VB-48-31                        Location : Vial 92
Acq. Operator   : SKG                                Inj :   1
Acq. Instrument : HPLC#12                     Inj Volume : 10 µl
Acq. Method     : C:\HPCHEM\1\METHODS\OTS1.M
Last changed    : 6/23/2022 11:16:39 AM by SKG
Analysis Method : C:\HPCHEM\1\METHODS\OTS1.M
Last changed    : 6/23/2022 1:09:37 PM by SKG
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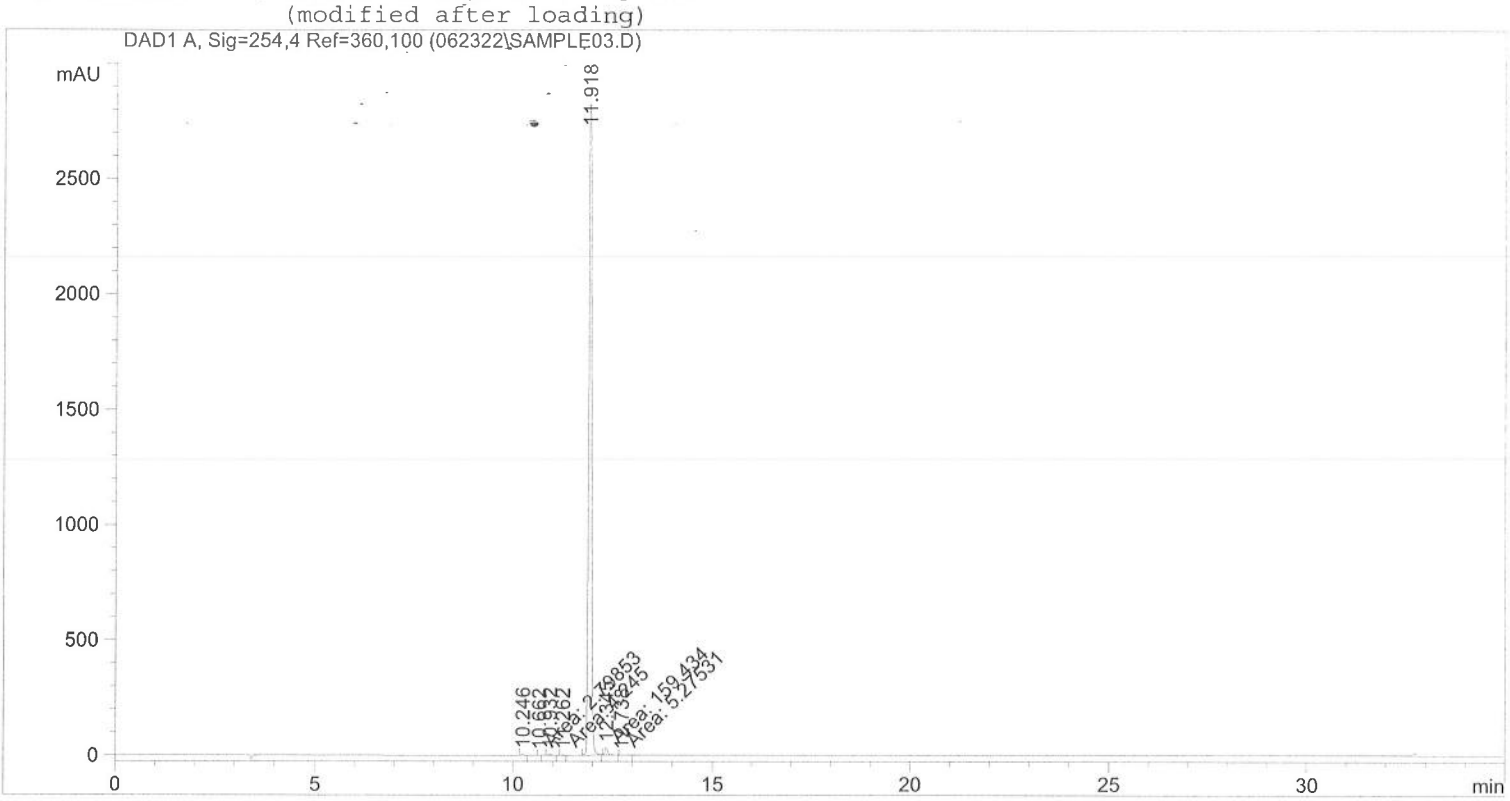


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==========================================================================
                        Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=254,4 Ref=360,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]    [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.246 BB    0.0622   25.32829    6.40033   0.1637
   2  10.662 MM    0.0672    2.79853 6.93571e-1   0.0181
   3  10.932 PP    0.0863   16.59558    3.10602   0.1073
   4  11.262 MM    0.0707    4.24500    1.00044   0.0274
   5  11.918 BB    0.0870 1.52578e4  2825.50488  98.6189
   6  12.345 MM    0.0833  159.43443   31.91090   1.0305
   7  12.738 MM    0.1480    5.27531 5.94223e-1   0.0341

Totals :                  1.54715e4  2869.21036

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```

SKG
06/24/22

```
==========================================================================
Injection Date  : 6/23/2022 12:30:36 PM          Seq. Line :   3
Sample Name     : VB-48-31                        Location : Vial 92
Acq. Operator   : SKG                                Inj :   1
Acq. Instrument : HPLC#12                      Inj Volume : 10 µl
Acq. Method     : C:\HPCHEM\1\METHODS\OTS1.M
Last changed    : 6/23/2022 11:16:39 AM by SKG
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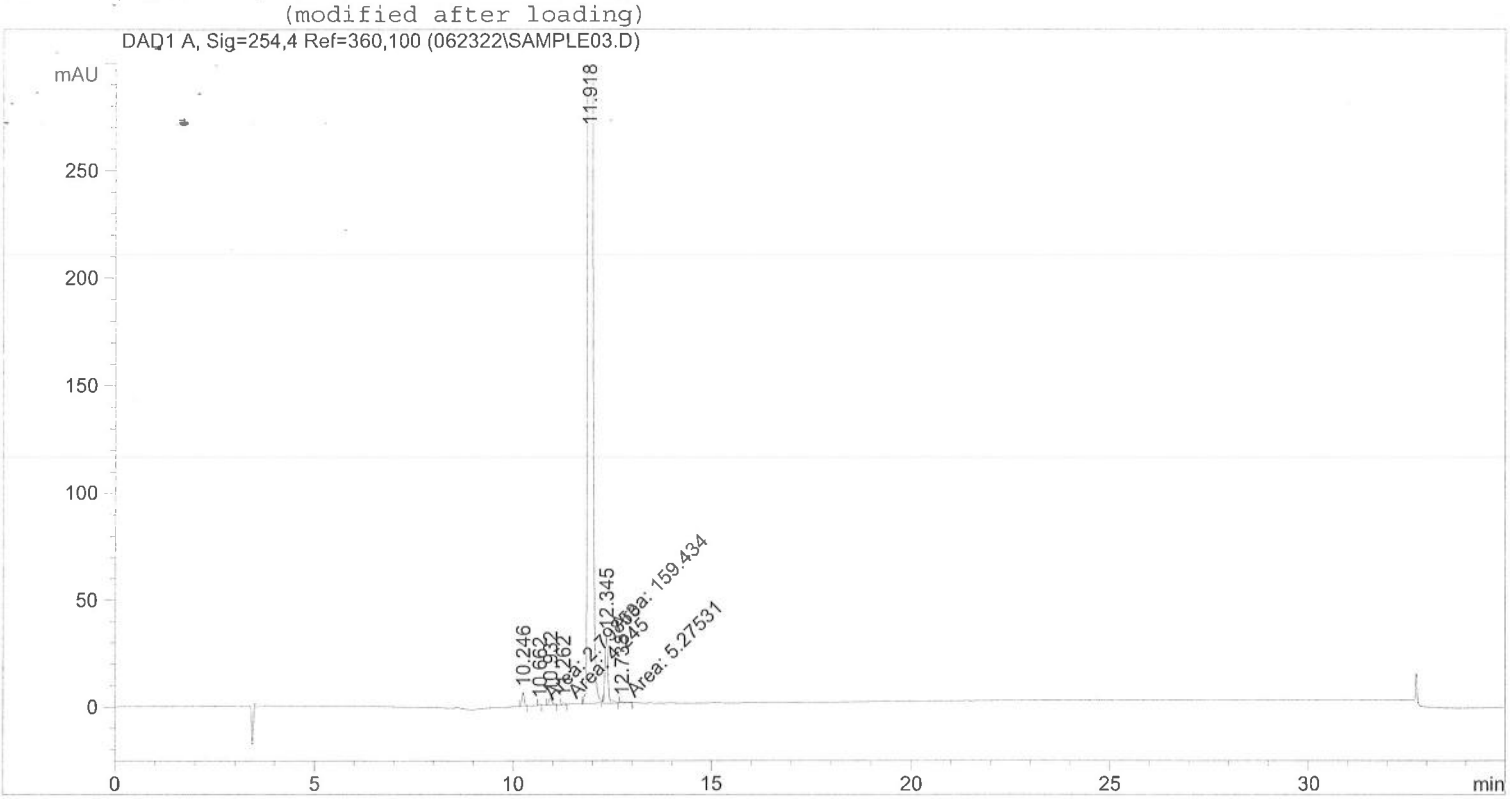


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==========================================================================
                        Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

SKG 06/24/22

```
Signal 1: DAD1 A, Sig=254,4 Ref=360,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]    [mAU*s]    [mAU]       %
----|-------|----|-------|----------|----------|--------|
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   2  10.662 MM    0.0672    2.79853 6.93571e-1   0.0181
   3  10.932 PP    0.0863   16.59558    3.10602   0.1073
   4  11.262 MM    0.0707    4.24500    1.00044   0.0274
   5  11.918 BB    0.0870 1.52578e4  2825.50488  98.6189
   6  12.345 MM    0.0833  159.43443   31.91090   1.0305
   7  12.738 MM    0.1480    5.27531 5.94223e-1   0.0341

Totals :                  1.54715e4  2869.21036

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```

```
==========================================================================
Injection Date  : 6/23/2022 11:54:24 AM          Seq. Line :   2
Sample Name     : Blank                           Location : Vial 91
Acq. Operator   : SKG                                Inj :   1
Acq. Instrument : HPLC#12                      Inj Volume : 10 µl
Acq. Method     : C:\HPCHEM\1\METHODS\OTS1.M
Last changed    : 6/23/2022 11:16:39 AM by SKG
Analysis Method : C:\HPCHEM\1\METHODS\OTS1.M
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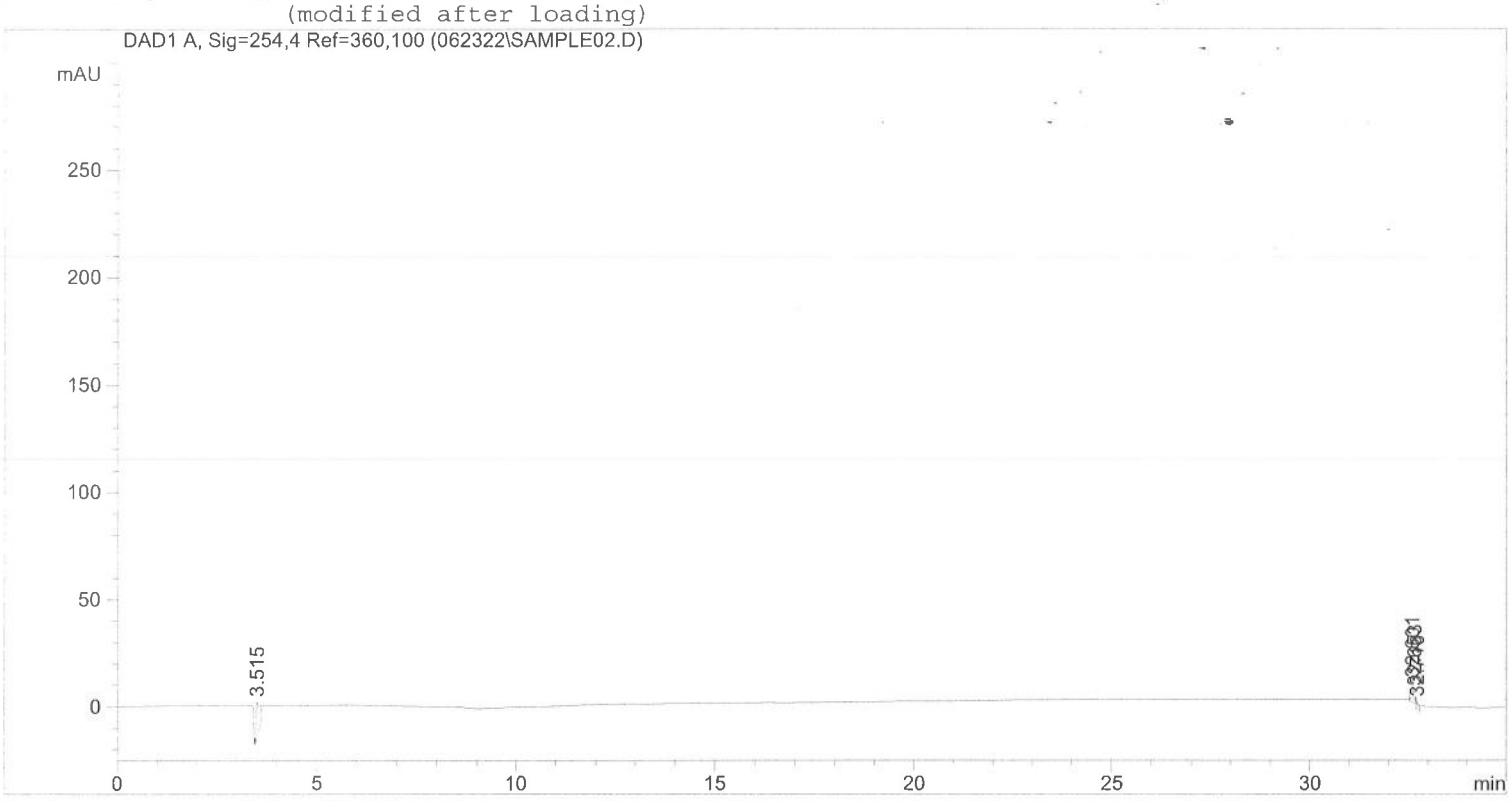


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==========================================================================
                        Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=254,4 Ref=360,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   3.515 PB    0.0915  101.30186   15.65269  68.0682
   2  32.601 BV    0.0559   33.79370    8.98677  22.7072
   3  32.653 VV    0.0314   12.02424    5.51757   8.0795
   4  32.716 VP    0.0281    1.70421 9.90315e-1   1.1451

Totals :                   148.82402   31.14735

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```

SKG
06/24/22

```
==========================================================================
Injection Date  : 6/23/2022 11:54:24 AM          Seq. Line :   2
Sample Name     : Blank                           Location : Vial 91
Acq. Operator   : SKG                                Inj :   1
Acq. Instrument : HPLC#12                       Inj Volume : 10 µl
Acq. Method     : C:\HPCHEM\1\METHODS\OTS1.M
Last changed    : 6/23/2022 11:16:39 AM by SKG
Analysis Method : C:\HPCHEM\1\METHODS\OTS1.M
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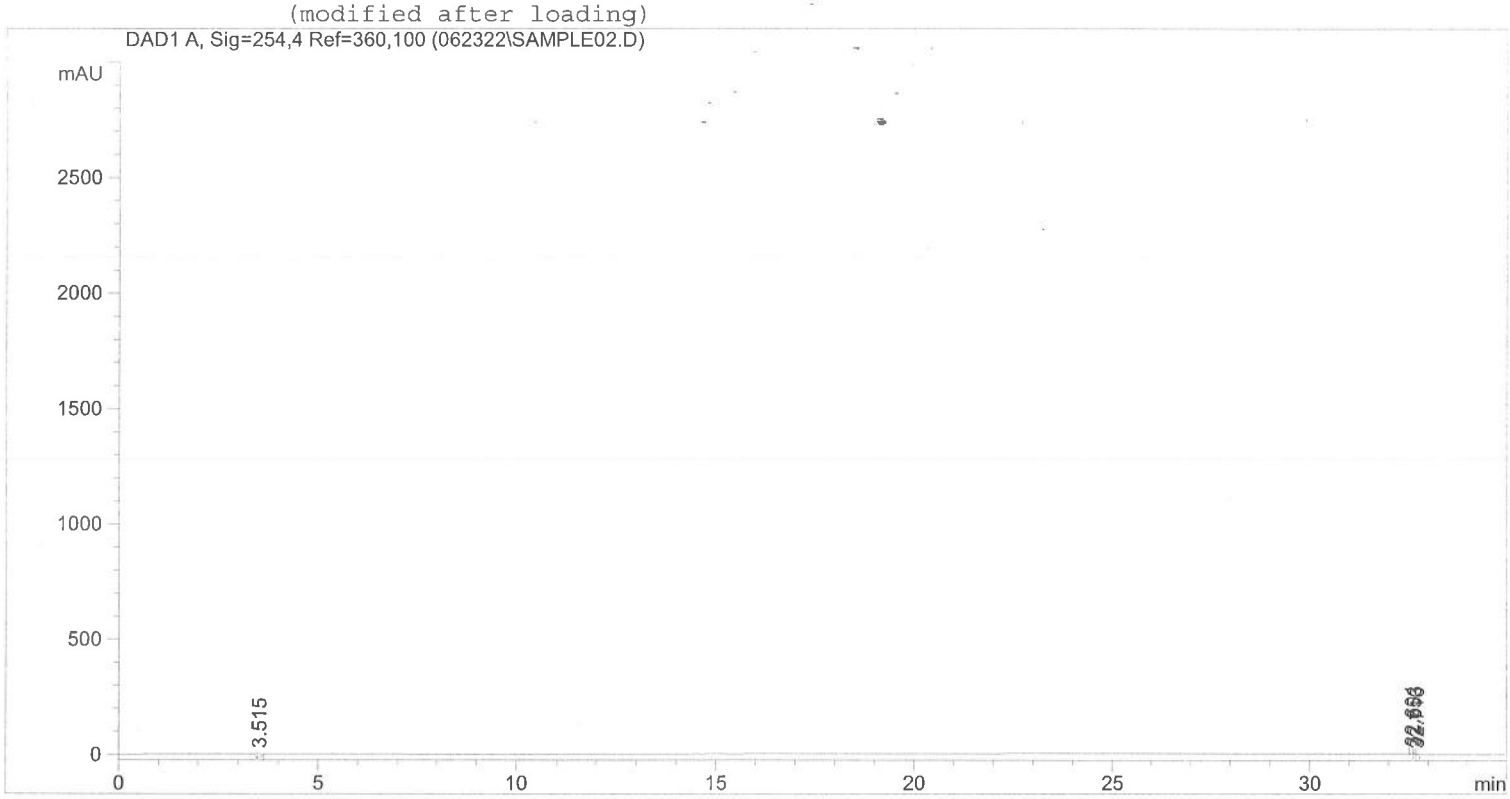


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==========================================================================
                        Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

SKG
06/24/22

```
Signal 1: DAD1 A, Sig=254,4 Ref=360,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]    [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   3.515 PB    0.0915  101.30186   15.65269  68.0682
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   4  32.716 VP    0.0281    1.70421 9.90315e-1   1.1451

Totals :                   148.82402   31.14735

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```