



File Properties

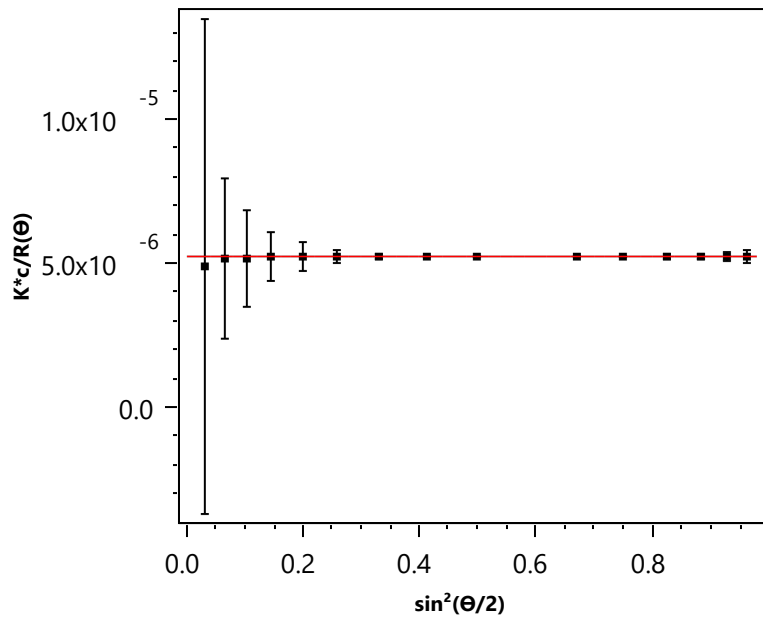
File Name: D:\GoogleDrive\LBNI\SIBYLS_Group\MALS and DLS Data\Sequences\Covid_poly10[072420_Covid2].afe7
Created: July 26, 2020 20:21:41.125

Sample: Covid_poly10

dn/dc: 0.1750 mL/g

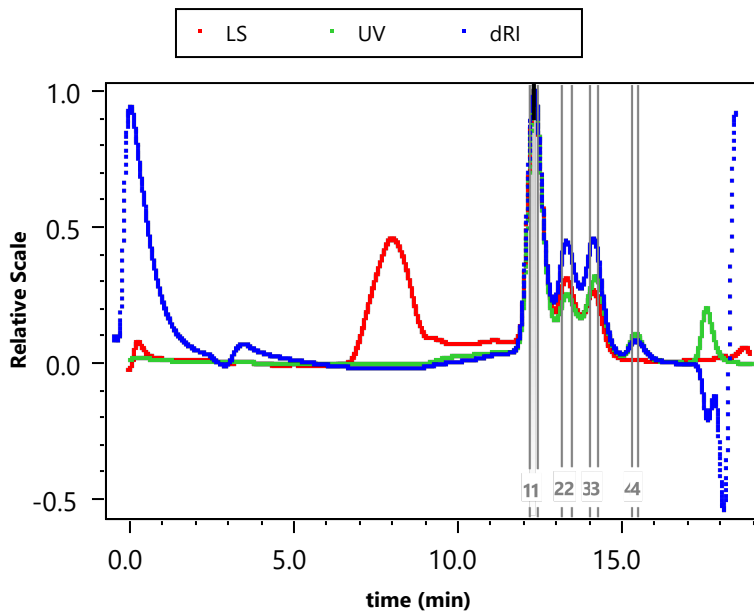
Concentration: 2.000 mg/mL

results graph



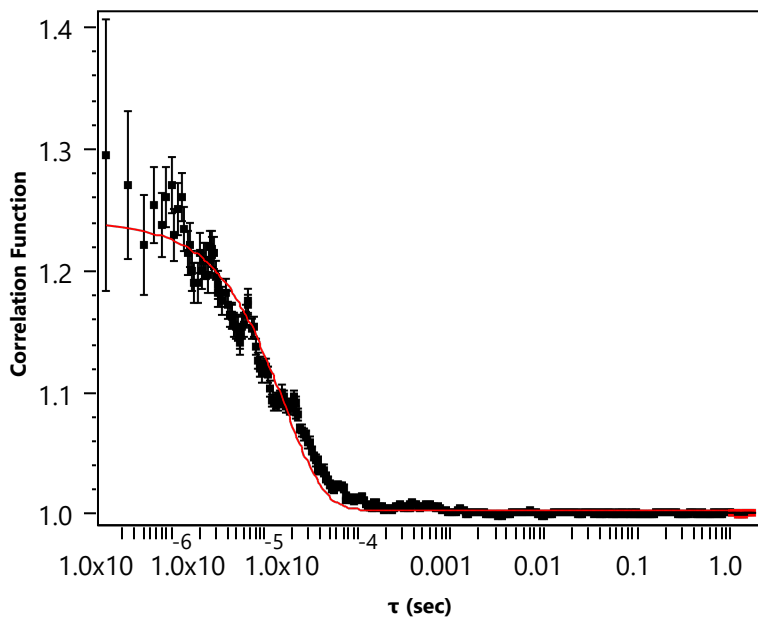
Fit $R^2=0.0607$

control graph



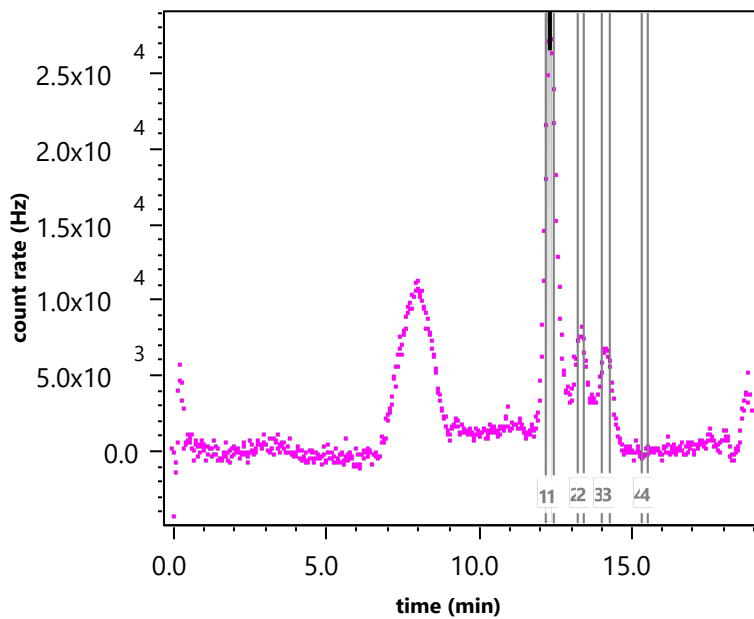
Index = 12.344 min

Correlation Function



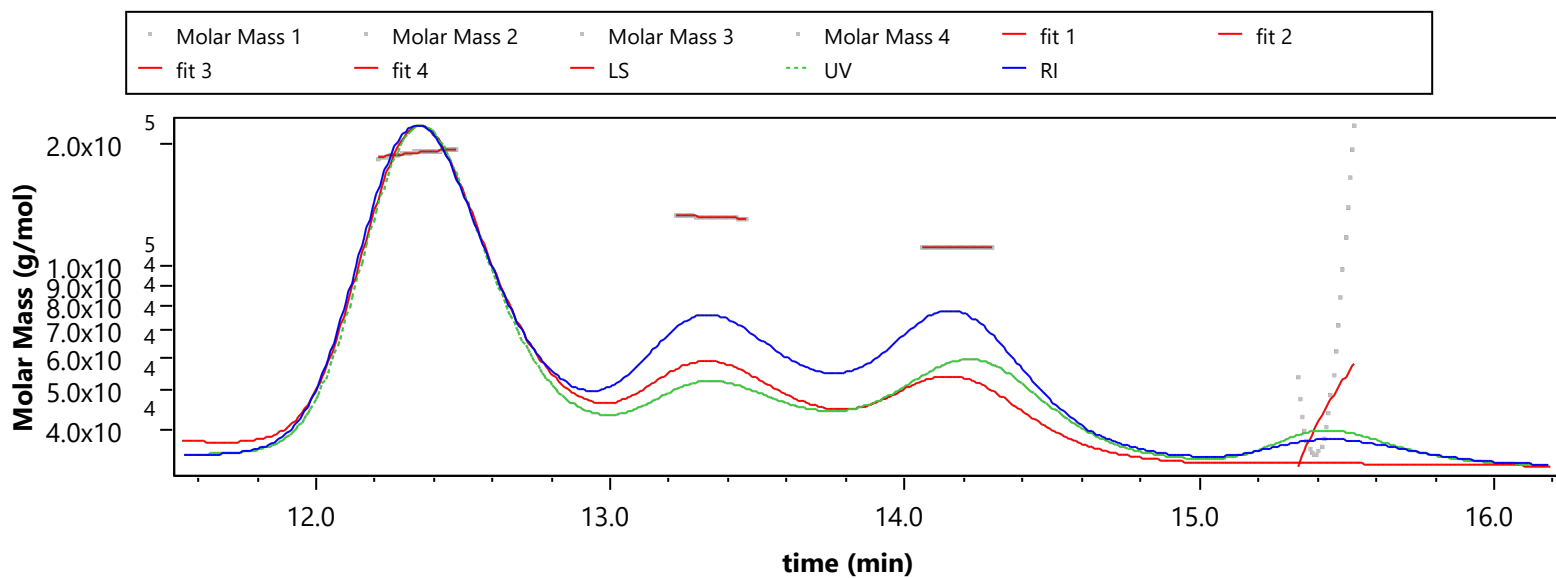
Fit $R^2=0.9287$

control graph



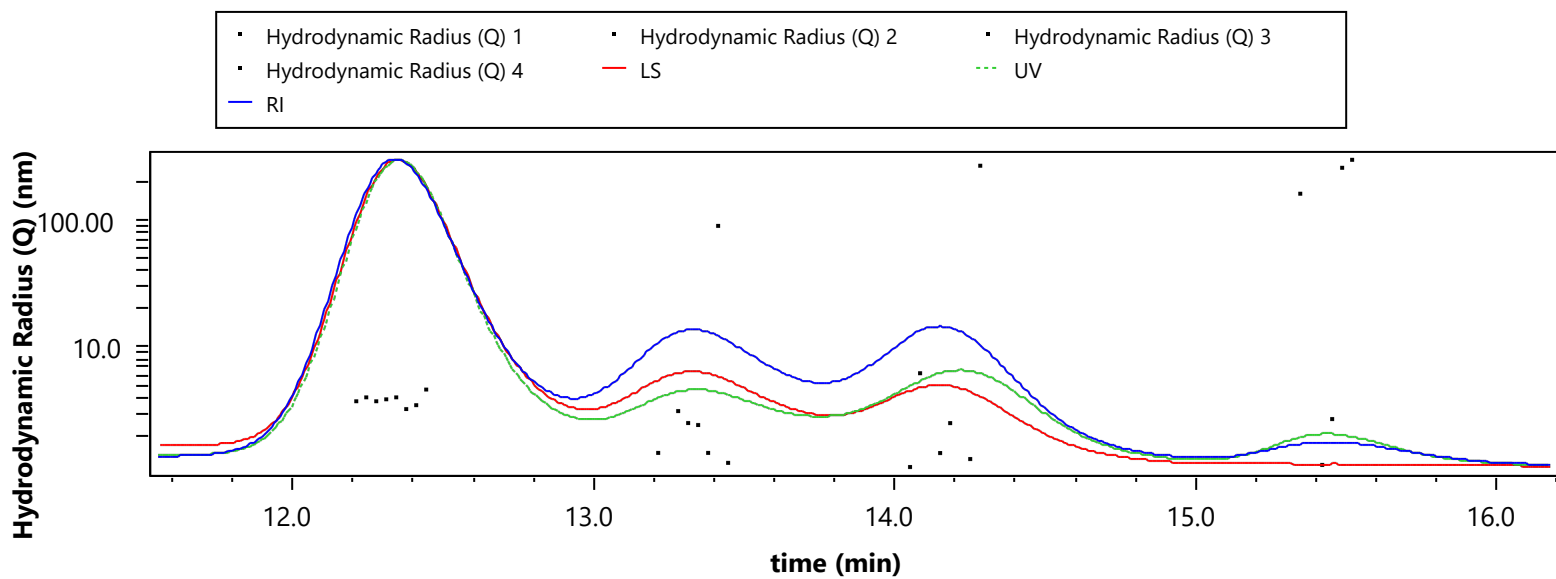
Index = 12.347 min

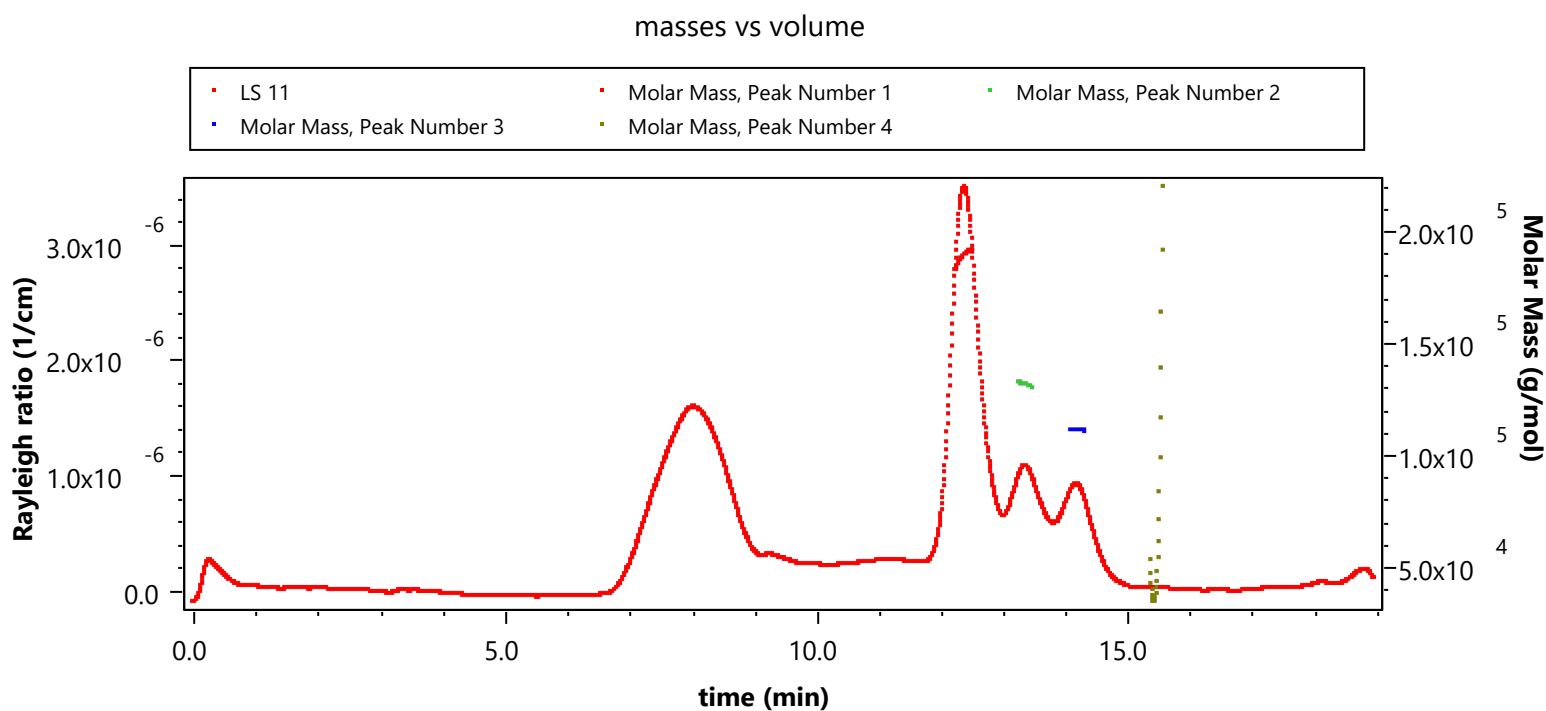
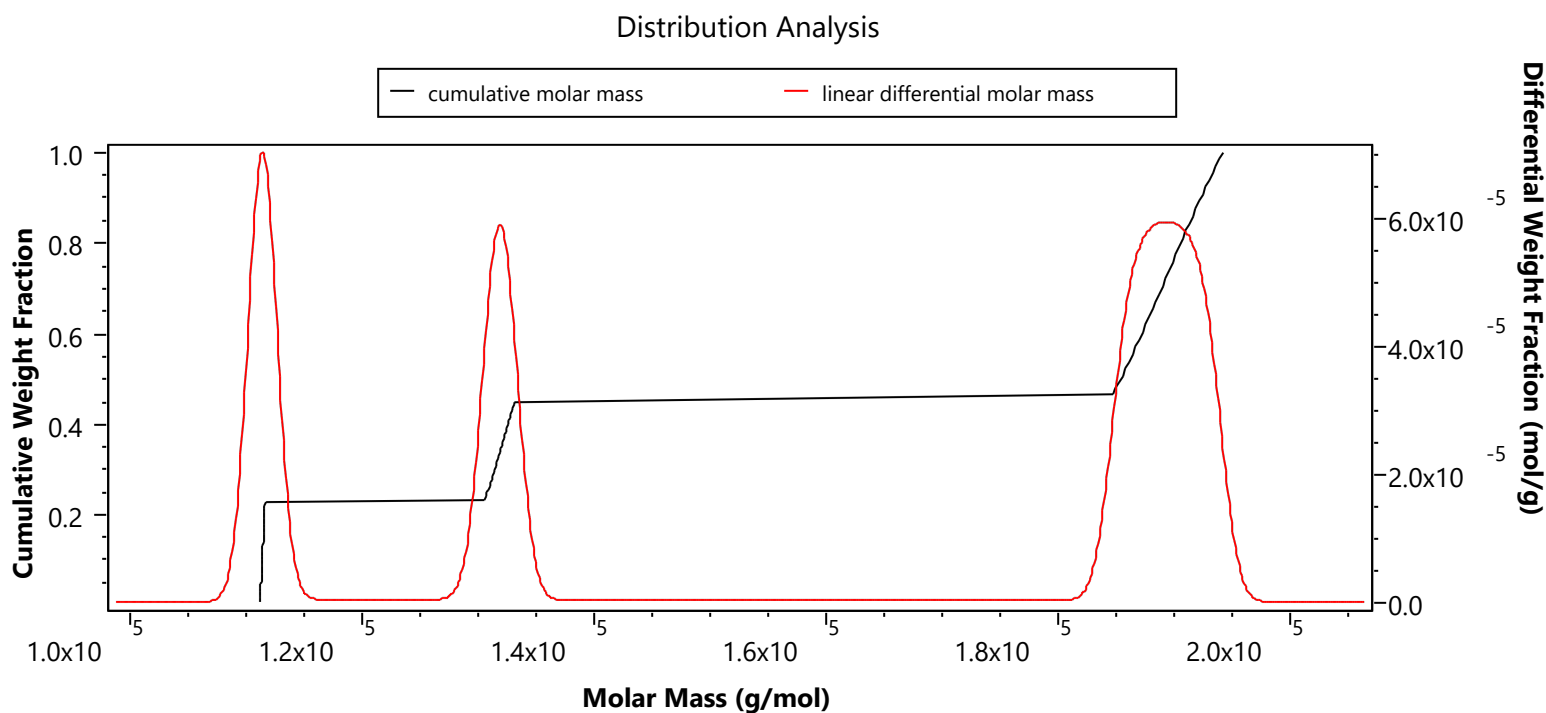
Results Fitting



Peak 1 Fit Adjusted $R^2=0.9264$; Peak 2 Fit Adjusted $R^2=0.9662$; Peak 3 Fit Adjusted $R^2=0.3763$; Peak 4 Fit Adjusted $R^2=0.1225$

Results Fitting





Configuration

Abscissa Units: min
 Concentration Source: RI
 Flow Rate: 0.500 mL/min
 Pulse Correction Enabled: yes

Light Scattering Instrument: DAWN HELEOS
 Cell Type: Fused Silica
 Wavelength: 660.0 nm
 Calibration Constant: 3.3316×10^{-5} 1/(V cm)

RI Instrument: Optilab T-rEX
 Wavelength: 658.0 nm

UV Instrument: Generic UV

Solvent: PBS, Aqueous

Refractive Index: 1.331

Fluid Connections

Source Instrument	Destination Instrument	Delay Volume (mL)
Generic Pump	Injector	0.000
Injector	Generic UV Instrument	0.000
Generic UV Instrument	DAWN HELEOS	0.026
DAWN HELEOS	Optilab rEX	0.222

Aux Connections

Source Instrument	Destination Instrument	Source Aux Channel	Destination Aux Channel	Calibration Constant
Generic UV Instrument	DAWN HELEOS		2	1.000
Generic UV Instrument	DAWN HELEOS	2	3	1.000

Autoinject Connections

Source Instrument	Destination Instrument
autoinject	DAWN HELEOS

Processing

Collection Operator: MICHAELFARADAY\Michael Faraday (MICHAELFARADAY\Michael Faraday (Michael Faraday))

Collection Time: Sunday, July 26, 2020 20:03:02 PM

Collection Version: 7.1.4.8

Processing Operator: ALAN-TURING\Alan Turing (Alan Turing)

Processing Time: Monday, July 27, 2020 09:59:06 AM

Despiking Level: Heavy

Peak settings:

Peak Name	Peak 1	Peak 2	Peak 3	Peak 4
Peak Limits (min)	12.200 - 12.479	13.212 - 13.463	14.048 - 14.299	15.330 - 15.535
Light Scattering Model	Zimm	Zimm	Zimm	Zimm
Fit Degree	1	1	1	1
dn/dc (mL/g)	0.1700	0.1700	0.1700	0.1700
dn/dc Ref. Temp. (°C)	25.000	25.000	25.000	25.000
Modifier dn/dc (mL/g)	0.0000	0.0000	0.0000	0.0000
Modifier dn/dc Ref. Temp. (°C)	25.000	25.000	25.000	25.000
A2 (mol mL/g ²)	0.000	0.000	0.000	0.000
UV Ext. Coef. (mL/(mg cm))	0.667	0.667	0.667	0.667
UV Ext. Coef. Ref. Temp. (°C)	25.000	25.000	25.000	25.000
Modifier UV Ext. Coef. (mL/(mg cm))	0.000	0.000	0.000	0.000
Modifier UV Ext. Coef. Ref. Temp. (°C)	25.000	25.000	25.000	25.000
Real Refractive Index	0	0	0	0
Imaginary Refractive Index	0	0	0	0
Shell Thickness (nm)	0.000	0.000	0.000	0.000
Shell Real Refractive Index	0	0	0	0
Shell Imaginary Refractive Index	0	0	0	0
Rod radius (nm)	0.000	0.000	0.000	0.000
Molecular Standard	n/a	n/a	n/a	n/a
Concentration (mg/mL)	2.000	2.000	2.000	2.000
Concentration Ref. Temp. (°C)	25.000	25.000	25.000	25.000
Mn (g/mol)	0.000	0.000	0.000	0.000
Mw (g/mol)	0.000	0.000	0.000	0.000
Mp (g/mol)	0.000	0.000	0.000	0.000
Intrinsic Viscosity (mL/g)	0.000	0.000	0.000	0.000
Intrinsic Viscosity Ref. Temp. (°C)	25.000	25.000	25.000	25.000
Mark-Houwink-Sakurada K (mL/g)	0.000	0.000	0.000	0.000
Mark-Houwink-Sakurada a	0	0	0	0
Flory-Fox Equation Phi Parameter	0	0	0	0
Ptitsyn-Eizner Equation Epsilon Parameter	0	0	0	0
Viscometry Model	Huggins	Huggins	Huggins	Huggins
Huggins Equation Parameter	0	0	0	0
Kraemers Equation Parameter	0	0	0	0
radius (nm)	3.480	3.480	3.480	3.480
Radius Type	rms	rms	rms	rms

Molar Mass & Radius from LS:

Peak Name: Peak 1
Molar Mass: (1.907 ± 0.023) e+5 g/mol
rms radius: 3.5 ± 12.4 nm
Light Scattering Model: Zimm
Fit Degree: 1
Concentration: (1.035 ± 0.094) e-1 mg/mL
dn/dc: 0.171 mL/g
Slice Index: 1514
Abscissa Position: 12.344 min

ASTRA Report Covid_poly10[072420_Covid2]

Fit R²: 0.0607

Enabled Detectors: 3 4 5 6 7 8 9 10 11 13 14 15 16 17 18

rh from QELS:

Use Disabled Slices: no

Prefilter Correlation Function before Averaging: yes

Minimum Delay for Fit: 2.000×10⁻⁷ sec

Maximum Delay for Fit: 1.0 sec

Minimum Radius Threshold: 1.00 nm

Maximum Radius Threshold: 300.00 nm

Suppress Distribution Peaks Below: 0.50 nm

Suppress Distribution Peaks Above: 10000.000 nm

Results Fitting Procedure:

Data	Fit Model	Degree	R ²	Extrapolation
Molar Mass	Polynomial	1	0.926444	none

Results

Peak Results

	Peak 1	Peak 2	Peak 3	Peak 4
Hydrodynamic radius (Q) moments (nm)				
rh(Q)n	3.774 (±5.686%)	14.821 (±16.064%)	43.661 (±13.584%)	n/a
Std Dev rh(Q)n	0.380	14.748	43.739	n/a
rh(Q)w	3.775 (±5.683%)	31.355 (±16.065%)	97.049 (±13.584%)	n/a
Std Dev rh(Q)w	0.383	31.355	97.049	n/a
rh(Q)z	3.775 (±5.680%)	14.675 (±16.065%)	43.816 (±13.583%)	n/a
Std Dev rh(Q)z	0.383	31.355	97.049	n/a
rh(Q)(avg)	3.676 (±1.989%)	1.618 (±6.728%)	1.429 (±7.960%)	2.121 (±26.701%)
General (mL/(mg cm))				
UV Ext. Coef. (mL/(mg cm))	2.090	1.200	1.505	2.834
Masses				
Injected Mass (µg)	100.00	100.00	100.00	100.00
Calculated Mass (µg)	13.64	5.68	5.60	0.82
Mass Recovery (%)	13.6	5.7	5.6	0.8
Mass Fraction (%)	53.0	22.1	21.8	3.2
Concentration (mg/mL)				
Average concentration	0.097 (±0.002%)	0.045 (±0.004%)	0.046 (±0.004%)	0.008 (±0.024%)
Molar mass moments (g/mol)				
Mn	1.894×10 ⁵ (±0.319%)	1.319×10 ⁵ (±1.018%)	1.114×10 ⁵ (±1.213%)	n/a
Mp	1.895×10 ⁵ (±0.228%)	1.321×10 ⁵ (±0.761%)	1.114×10 ⁵ (±0.897%)	0.000
Mv	n/a	n/a	n/a	n/a
Mw	1.894×10 ⁵ (±0.319%)	1.319×10 ⁵ (±1.018%)	1.114×10 ⁵ (±1.213%)	n/a
Mz	1.894×10 ⁵ (±0.713%)	1.319×10 ⁵ (±2.276%)	1.114×10 ⁵ (±2.713%)	n/a
Mz+1	1.895×10 ⁵ (±1.149%)	1.319×10 ⁵ (±3.670%)	1.114×10 ⁵ (±4.375%)	n/a
M(avg)	1.893×10 ⁵ (±0.051%)	1.319×10 ⁵ (±0.174%)	1.114×10 ⁵ (±0.207%)	4.180×10 ⁴ (±11.589%)
Polydispersity				
Mw/Mn	1.000 (±0.451%)	1.000 (±1.440%)	1.000 (±1.716%)	n/a
Mz/Mn	1.000 (±0.781%)	1.000 (±2.493%)	1.000 (±2.972%)	n/a
rms radius moments (nm)				
rn	0.4 (±25171.5%)	n/a	10.8 (±148.3%)	n/a
Std Dev rn	5.801	n/a	6.401	n/a
rw	0.8 (±7182.9%)	n/a	10.8 (±148.3%)	n/a
Std Dev rw	5.790	n/a	6.401	n/a
rz	1.1 (±4197.0%)	n/a	10.8 (±148.2%)	n/a
Std Dev rz	5.778	n/a	6.401	n/a
r(avg)	4.8 (±43.8%)	2.7 (±594.6%)	10.7 (±27.4%)	89.6 (±17.5%)
Light scattering peak statistics				
Peak Area (1/cm min)	8.887×10 ⁻⁷	9.946×10 ⁻⁷	7.406×10 ⁻⁷	9.524×10 ⁻⁸
Peak Height (1/cm)	3.517×10 ⁻⁶	1.087×10 ⁻⁶	9.419×10 ⁻⁷	3.099×10 ⁻⁷
Retention Time (min)	12.350	13.326	14.153	15.530
Peak Width at Half-Height (min)	0.000	0.000	0.000	0.038
Peak Width at Quarter-Height (min)	0.000	0.000	0.000	0.077
Peak Width at Tenth-Height (min)	0.000	0.000	0.000	0.000

	Peak 1	Peak 2	Peak 3	Peak 4				
Peak Width at User-Specified-Height (4.4%, min)	0.000	0.000	0.000	0.000				
Asymmetry Factor	0.000	0.000	0.000	0.000				
Tailing Factor	0.000	0.000	0.000	0.000				
Column Plate Count	0.000	0.000	0.000	942281.822				
Mean (min)	12.342	13.338	14.173	15.466				
Standard Deviation (min)	0.078	0.070	0.070	0.060				
Skew	-2.439	2.415	5.811	-509.409				
Peak Area (%)	32.683	36.578	27.237	3.503				
Resolution Relative to Peak 2	0.000	n/a	0.000	69.016				
Refractive index peak statistics								
Peak Area (RIU min)	4.637×10 ⁻⁶	1.931×10 ⁻⁶	1.904×10 ⁻⁶	2.792×10 ⁻⁷				
Peak Height (RIU)	1.764×10 ⁻⁵	7.866×10 ⁻⁶	8.075×10 ⁻⁶	1.425×10 ⁻⁶				
Retention Time (min)	12.344	13.325	14.152	15.439				
Peak Width at Half-Height (min)	0.000	0.000	0.000	0.000				
Peak Width at Quarter-Height (min)	0.000	0.000	0.000	0.000				
Peak Width at Tenth-Height (min)	0.000	0.000	0.000	0.000				
Peak Width at User-Specified-Height (4.4%, min)	0.000	0.000	0.000	0.000				
Asymmetry Factor	0.000	0.000	0.000	0.000				
Tailing Factor	0.000	0.000	0.000	0.000				
Column Plate Count	0.000	0.000	0.000	0.000				
Mean (min)	12.341	13.336	14.172	15.433				
Standard Deviation (min)	0.079	0.072	0.070	0.057				
Skew	-0.398	0.238	2.108	-2.470				
Peak Area (%)	52.989	22.063	21.756	3.191				
Resolution Relative to Peak 2	0.000	n/a	0.000	0.000				
UV peak statistics								
Peak Area (channel 1) (AU min)	5.700×10 ⁻²	1.363×10 ⁻²	1.686×10 ⁻²	4.655×10 ⁻³				
Peak Area (channel 2) (AU min)	-0.000	-0.000	0.000	0.000				
Peak Height (channel 1) (AU)	2.211×10 ⁻¹	5.566×10 ⁻²	6.969×10 ⁻²	2.381×10 ⁻²				
Peak Height (channel 2) (AU)	-0.000	-0.000	0.000	0.000				
Retention Time (channel 1) (min)	12.354	13.340	14.218	15.435				
Retention Time (channel 2) (min)	11.675	13.270	14.042	14.916				
Peak Width at Half-Height (channel 1) (min)	0.000	0.000	0.000	0.000				
Peak Width at Half-Height (channel 2) (min)	0.000	0.000	0.000	0.000				
Peak Width at Quarter-Height (channel 1) (min)	0.000	0.000	0.000	0.000				
Peak Width at Quarter-Height (channel 2) (min)	0.000	0.000	0.000	0.000				
Peak Width at Tenth-Height (channel 1) (min)	0.000	0.000	0.000	0.000				
Peak Width at Tenth-Height (channel 2) (min)	0.000	0.000	0.000	0.000				
Peak Width at User-Specified-Height (channel 1) (4.4%, min)	0.000	0.000	0.000	0.000				
Peak Width at User-Specified-Height (channel 2) (4.4%, min)	0.000	0.000	0.000	0.000				
Asymmetry Factor (channel 1)	0.000	0.000	0.000	0.000				
Asymmetry Factor (channel 2)	0.000	0.000	0.000	0.000				
Column Plate Count (channel 1)	0.000	0.000	0.000	0.000				
Column Plate Count (channel 2)	0.000	0.000	0.000	0.000				
Tailing Factor (channel 1)	0.000	0.000	0.000	0.000				
Tailing Factor (channel 2)	0.000	0.000	0.000	0.000				
Mean (channel 1) (min)	12.339	13.339	14.177	15.436				
Mean (channel 2) (min)	12.326	13.328	14.179	15.434				
Standard Deviation (channel 1) (min)	0.078	0.072	0.072	0.058				
Standard Deviation (channel 2) (min)	0.080	0.070	0.073	0.059				
Skew (channel 1)	-0.016	-0.003	-0.034	-0.004				
Skew (channel 2)	0.000	0.000	-1.291	0.423				
Peak Area % (channel 1) (%)	61.858	14.794	18.296	5.052				
Peak Area % (channel 2) (%)	-309.241	-83.185	245.387	247.039				
Resolution Relative to Peak 2	0.000	0.000	n/a	n/a	0.000	0.000	0.000	0.000
Translational diffusion coefficient moments (cm²/sec)								
Dt(n)	8.56×10 ⁻⁷ (±5.64%)	1.53×10 ⁻⁶ (±16.08%)	1.59×10 ⁻⁶ (±17.08%)	n/a				
Dt(w)	8.56×10 ⁻⁷ (±5.64%)	1.53×10 ⁻⁶ (±16.08%)	1.59×10 ⁻⁶ (±17.08%)	n/a				
Dt(z)	8.56×10 ⁻⁷ (±5.64%)	1.53×10 ⁻⁶ (±16.08%)	1.59×10 ⁻⁶ (±17.08%)	n/a				

Dt(avg)	Peak 1	Peak 2	Peak 3	Peak 4
	8.44×10^{-7}	3.92×10^{-8}	1.21×10^{-8}	1.16×10^{-8}
	(±1.99%)	(±14.17%)	(±13.03%)	(±6.71%)

laser monitor average: 0.999 V

Forward Monitor Average: 0.940 V

laser current average: 0.156 amps

laser voltage average: -225616.375 V

rh(Q) conformation plot slope: -0.477 (±22.613%) log(nm)/log(g/mol)

rh(Q) Conformation Plot y-intercept: 3.083 (±18.342%) log(nm)

rms radius vs. rh(Q) plot slope: 0.416 (±0.519%) rms radius vs. rh(Q) plot slope

rms radius vs. rh(Q) Plot y-intercept: 7.463 (±2.918%) log(nm)