

Supporting information

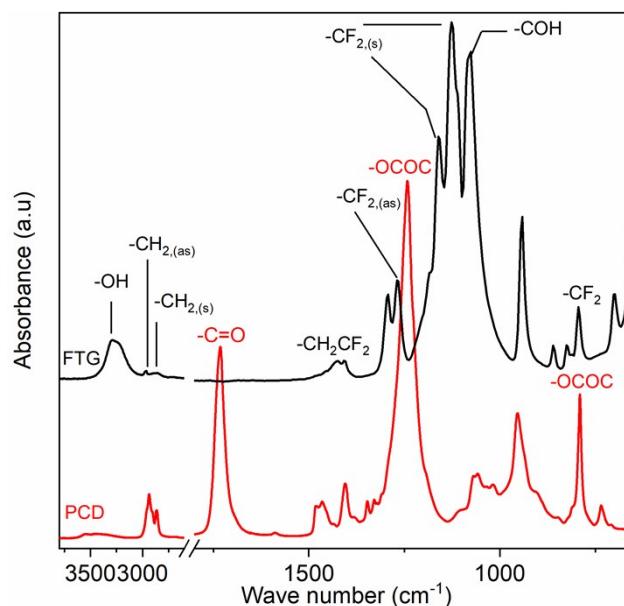


Figure S1 IR spectra of FTG and PCD

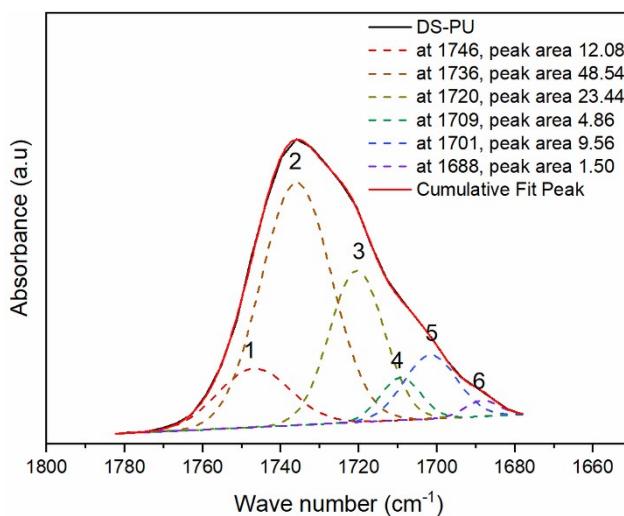


Figure S2 IR peak deconvolution of DS-PU

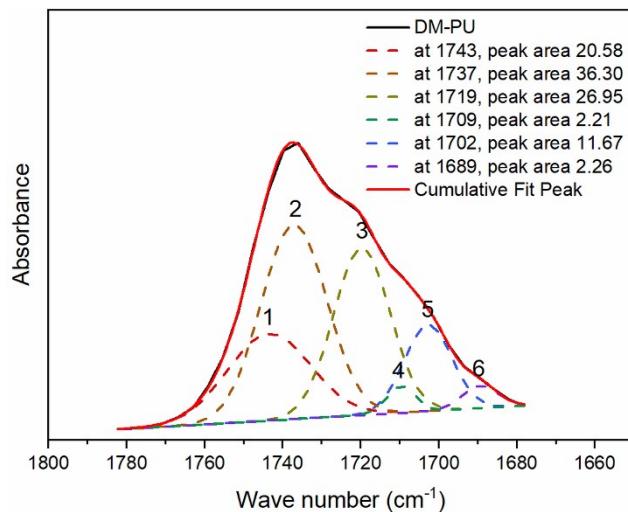


Figure S3 IR peak deconvolution of DM-PU

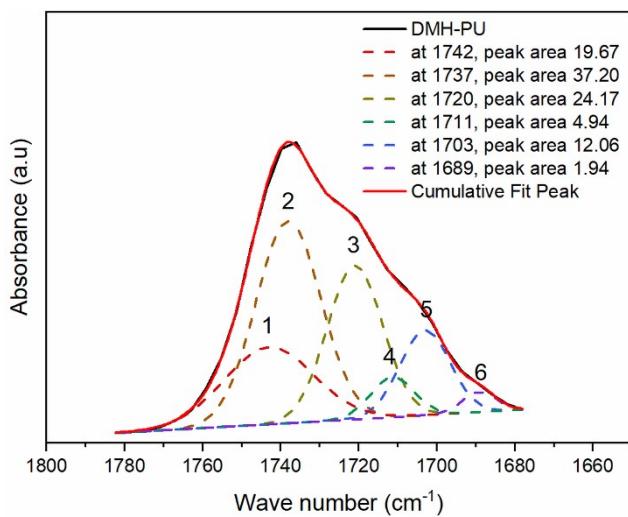


Figure S4 IR peak deconvolution of DMH-PU

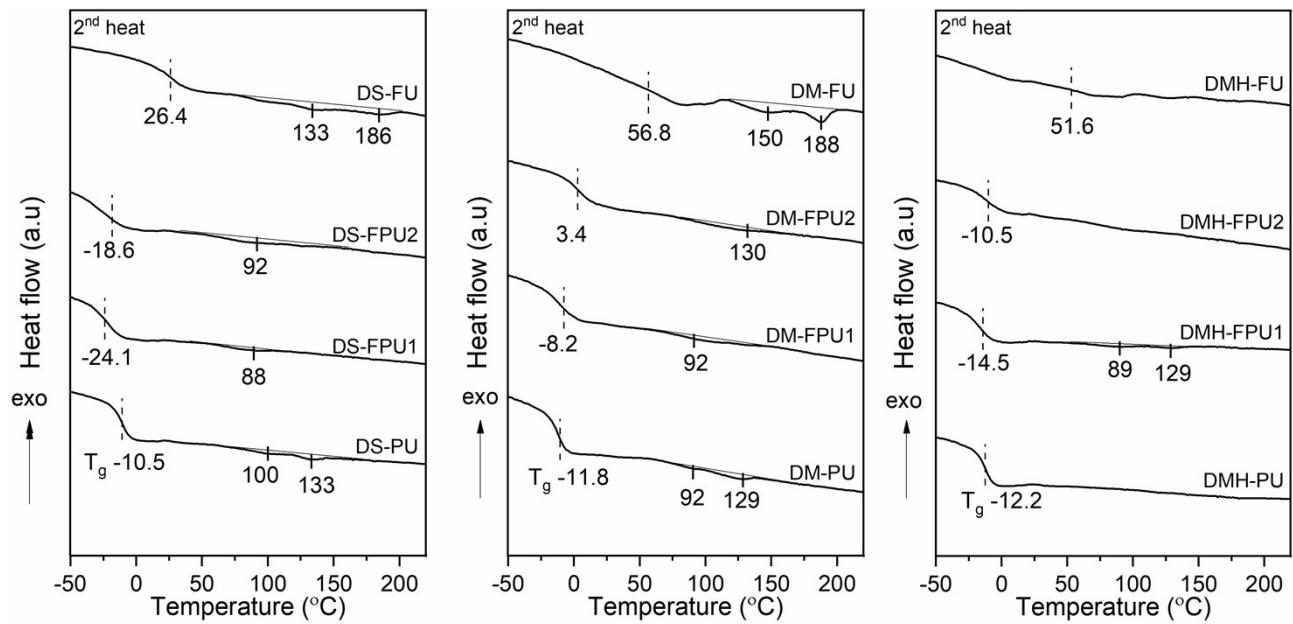


Figure S5 DSC thermograms of PU, FPU and FU

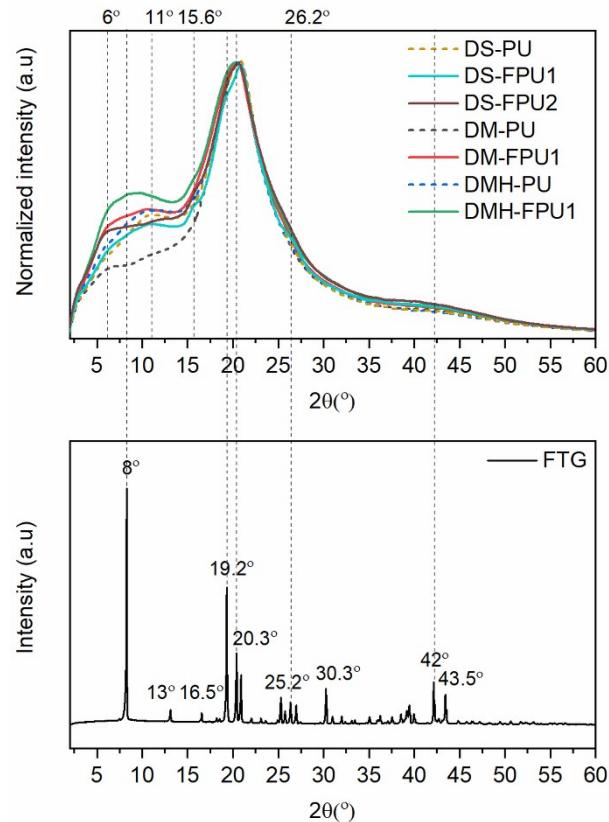
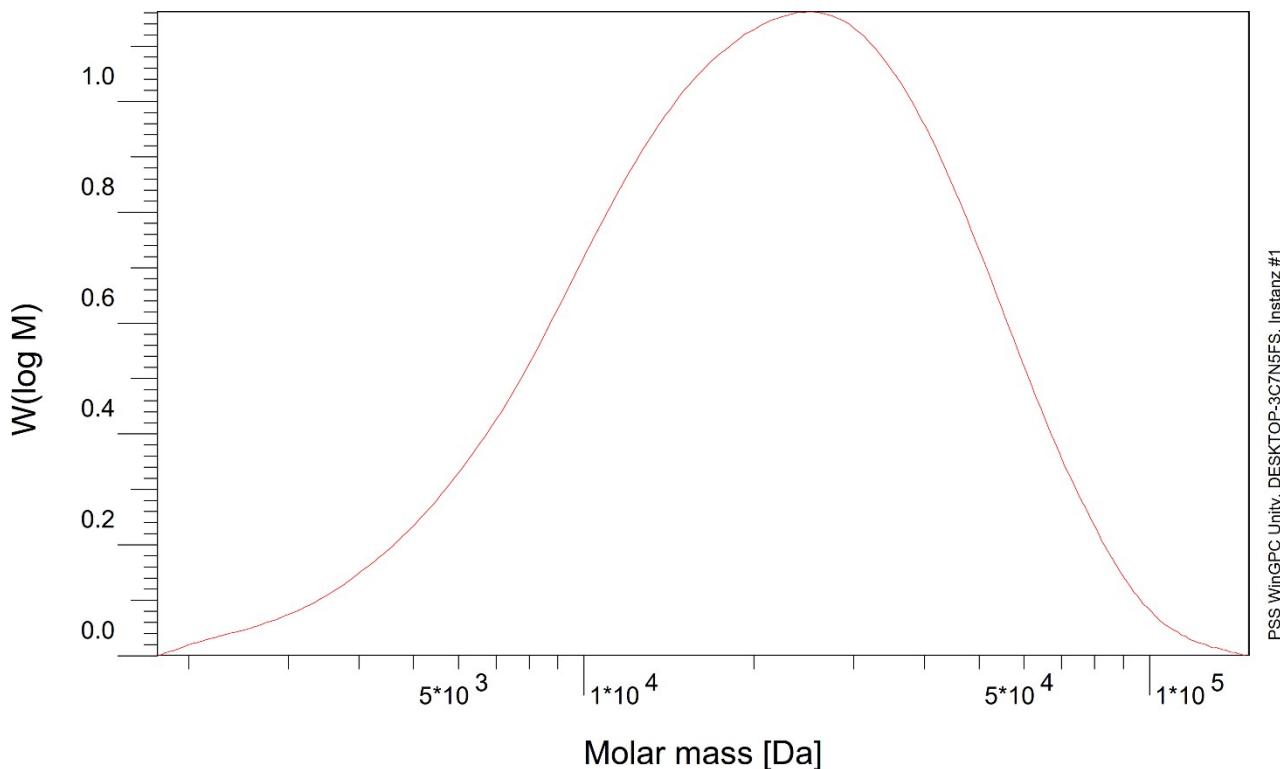


Figure S6 X-Ray diffraction of PU, FPU, FU film and FTG powder

Gel permeation chromatography (GPC) Profile

Table 1 Molar mass of PU and FPU in different solvent bases

Sample Name	Molar mass		
	M_w (g mol ⁻¹)	M_n (g mol ⁻¹)	PDI (M_w/M_n)
DS-PU	26,504	15,102	1.75
DS-FPU1	30,344	16,797	1.80
DS-FPU2	25,340	13,813	1.83
DS-FU	17,811	10,022	1.77
DM-PU	38,085	22,014	1.73
DM-FPU1	25,264	13,102	1.92
DM-FPU2	15,758	8,382	1.88
DM-FU	8,219	5,280	1.55
DMH-PU	65,384	41,946	1.55
DMH-FPU1	24,694	14,212	1.73
DMH-FPU2	17,000	9,041	1.88
DMH-FU	11,102	6,248	1.77

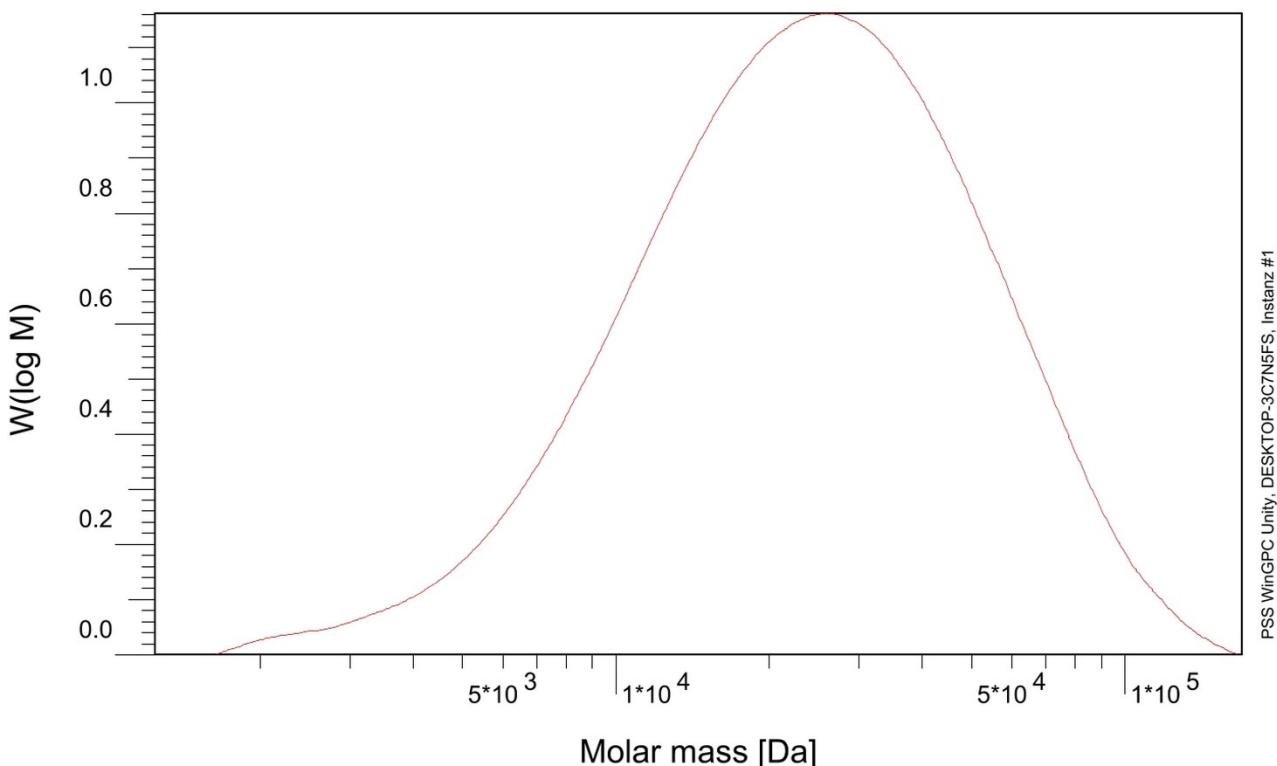


Probe :	Vial 4: DS-PU	
Integration von :	Freitag 19/07/19 13:44:23	18.655 ml
Integration bis :	Freitag 19/07/19 13:57:37	25.312 ml
Kalibration :	DMF+LiBr_PS_0,5_20190108.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	29.055 ml	28.883 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	0.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	1.5142e4	g/mol
Mw :	2.6504e4	g/mol
Mz :	4.0424e4	g/mol
Mv :	0.000000	g/mol
D :	1.7504e0	
[n]:	0.000000	ml/g
Vp :	2.2198e1	ml
Mp :	2.0653e4	g/mol
FI :	2.9506e3	ml*V
< 1757	0.00	
w% :	100.00	
> 150106	0.00	

Figure S7 GPC Profile of DS-PU

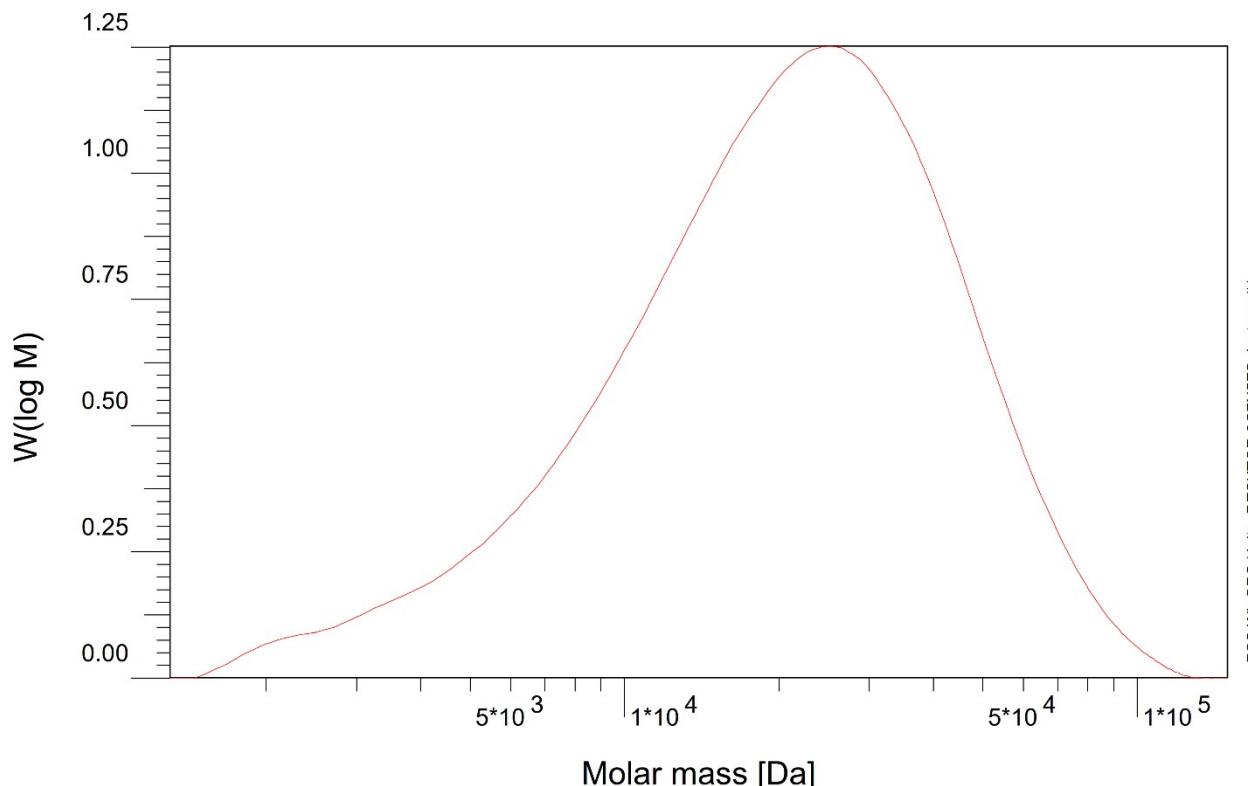


Probe :	Vial 2: DS-FPU1	
Integration von :	Montag 29/07/19 18:08:07	18.411 ml
Integration bis :	Montag 29/07/19 18:22:42	25.734 ml
Kalibration :	DMF+LiBr_PS_0,5_20190108.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	29.055 ml	28.909 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	0.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	1.6797e4	g/mol
Mw :	3.0344e4	g/mol
Mz :	4.7458e4	g/mol
Mv :	0.000000	g/mol
D :	1.8066e0	
[n]:	0.000000	ml/g
Vp :	2.2087e1	ml
Mp :	2.2250e4	g/mol
FI :	3.4251e3	ml*V
< 1240	0.00	
w% :	100.00	
> 170032	0.00	

Figure S8 GPC Profile of DS-FPU1

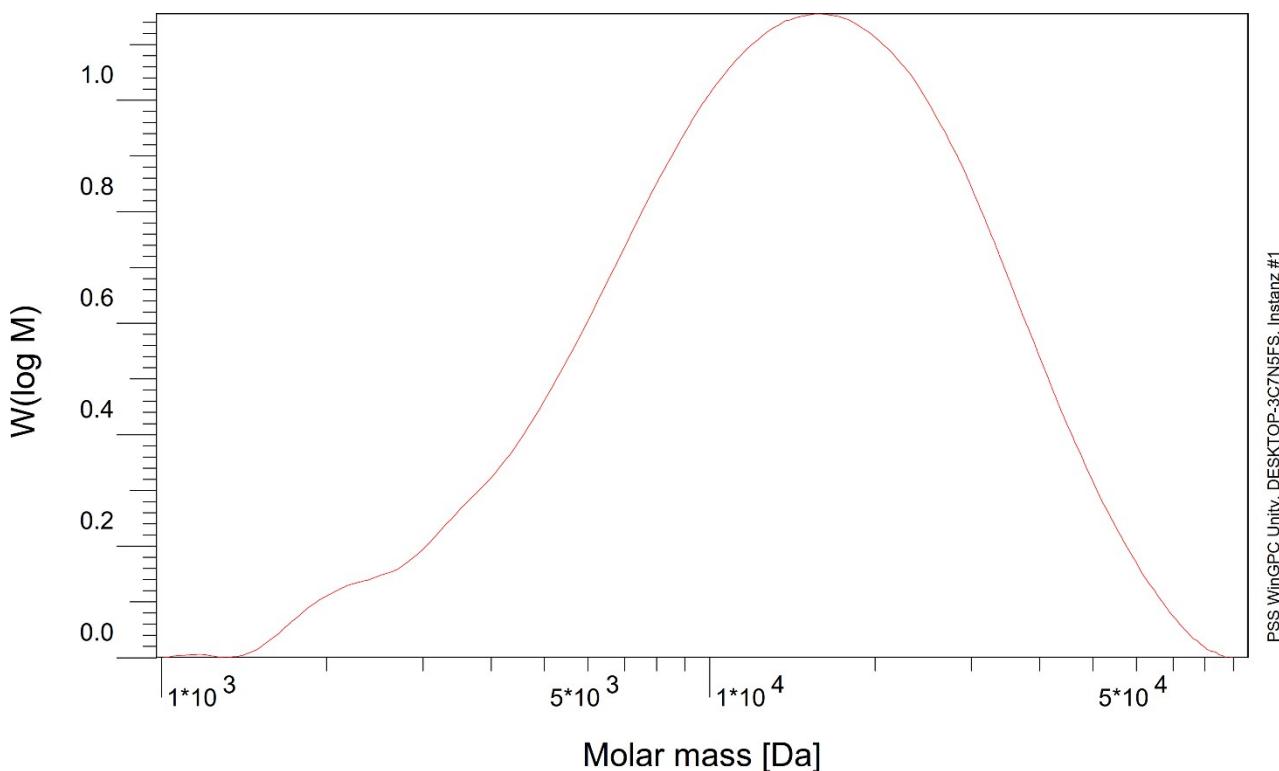


Probe :	Vial 5: DS-FPU2	
Integration von :	Montag 29/07/19 21:27:17	18.654 ml
Integration bis :	Montag 29/07/19 21:41:16	25.680 ml
Kalibration :	DMF+LiBr_PS_0,5_20190108.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	29.055 ml	28.906 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	0.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	1.3813e4	g/mol
Mw :	2.5340e4	g/mol
Mz :	3.7960e4	g/mol
Mv :	0.000000	g/mol
D :	1.8345e0	
[n]:	0.000000	ml/g
Vp :	2.2052e1	ml
Mp :	2.2762e4	g/mol
FI :	3.0205e3	ml*V
< 1296	0.00	
w% :	100.00	
> 150150	0.00	

Figure S9 GPC Profile of DS-FPU2

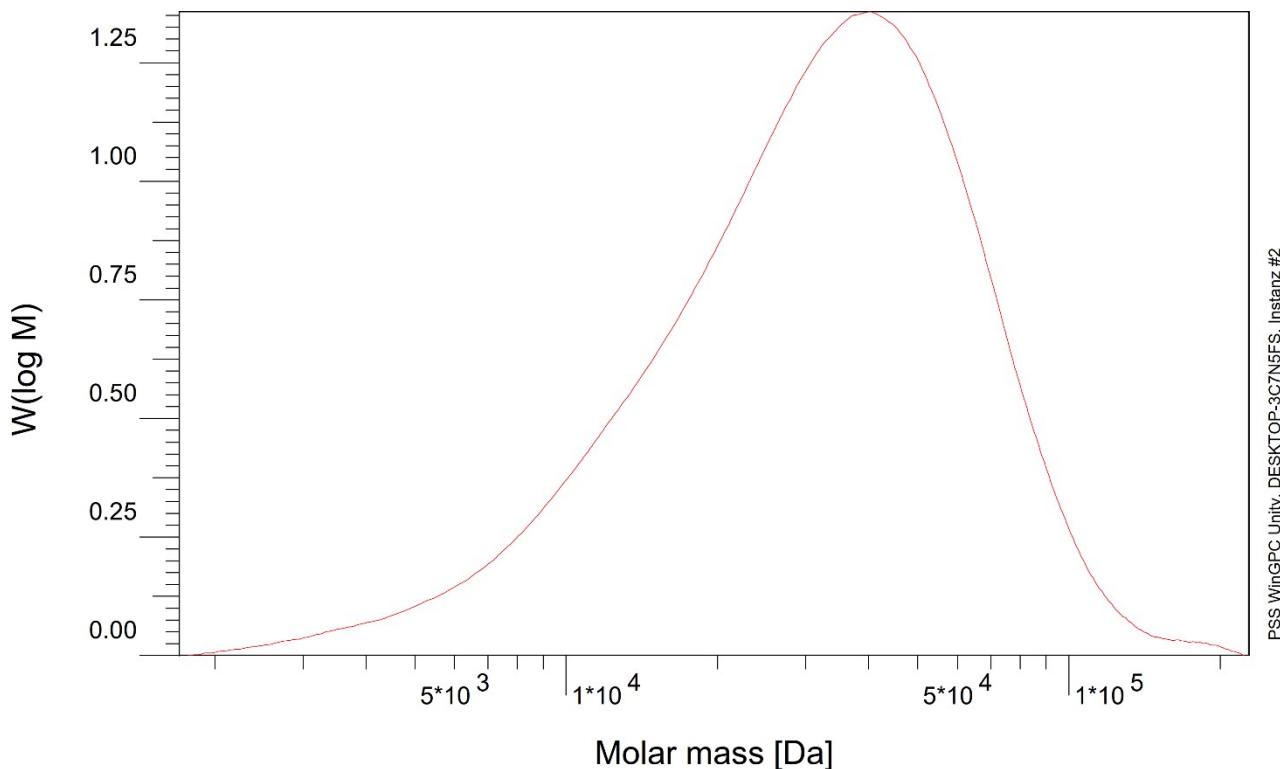


Probe :	Vial 4: DS-FU	
Integration von :	Montag 29/07/19 20:22:49	19.538 ml
Integration bis :	Montag 29/07/19 20:35:44	26.033 ml
Kalibration :	DMF+LiBr_PS_0,5_20190108.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	29.055 ml	28.909 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	0.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	1.0022e4	g/mol
Mw :	1.7811e4	g/mol
Mz :	2.7233e4	g/mol
Mv :	0.000000	g/mol
D :	1.7772e0	
[n]:	0.000000	ml/g
Vp :	2.2782e1	ml
Mp :	1.3698e4	g/mol
FI :	2.9212e3	ml*V
< 978	0.00	
w% :	100.00	
> 95825	0.00	

Figure S10 GPC Profile of DS-FU

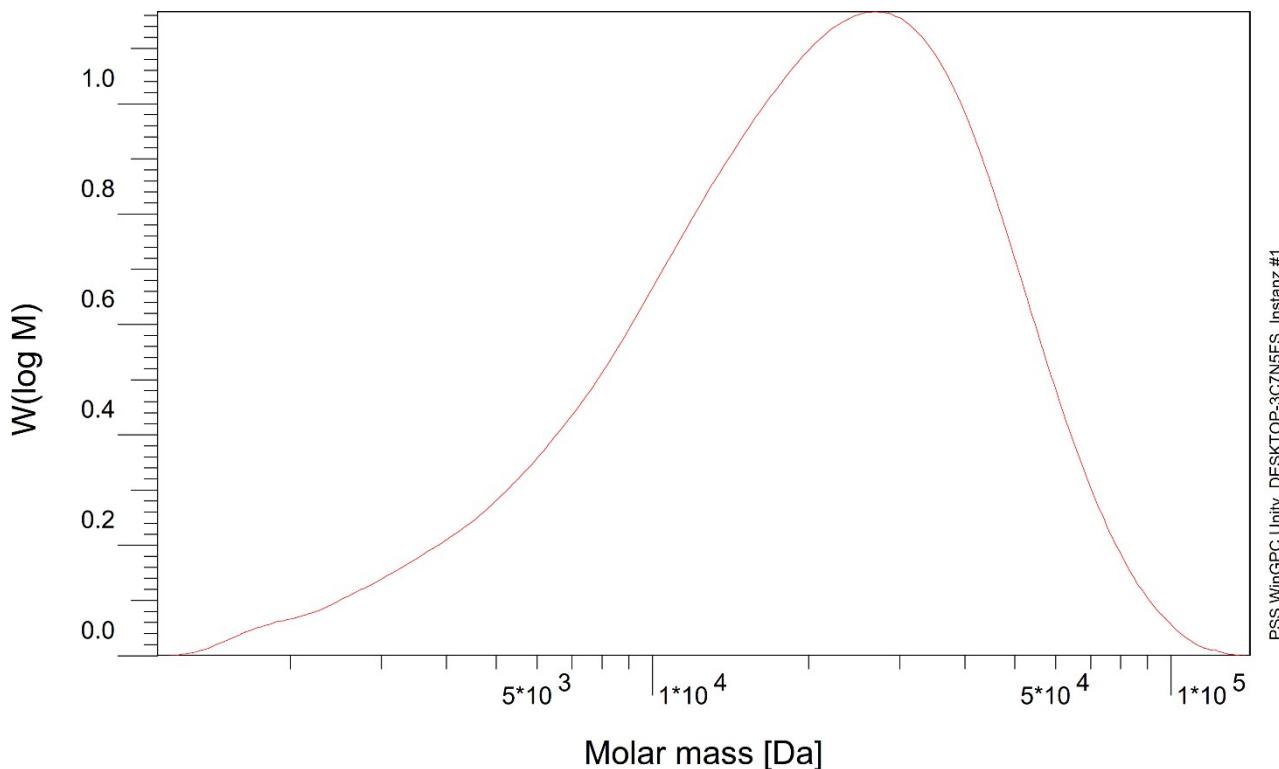


Probe :	Vial 9: DM-PU	
Integration von :	Mittwoch 07/08/19 18:15:00	17.717 ml
Integration bis :	Mittwoch 07/08/19 18:30:02	25.244 ml
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	28.828 ml	28.788 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	0.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operator :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	2.2014e4	g/mol
Mw :	3.8085e4	g/mol
Mz :	5.5487e4	g/mol
Mv :	0.000000	g/mol
D :	1.7300e0	
[n]:	0.000000	ml/g
Vp :	2.1151e1	ml
Mp :	3.7001e4	g/mol
FI :	3.7800e3	ml*V
< 1697	0.00	
w% :	100.00	
> 228270	0.00	

Figure S11 GPC Profile of DM-PU

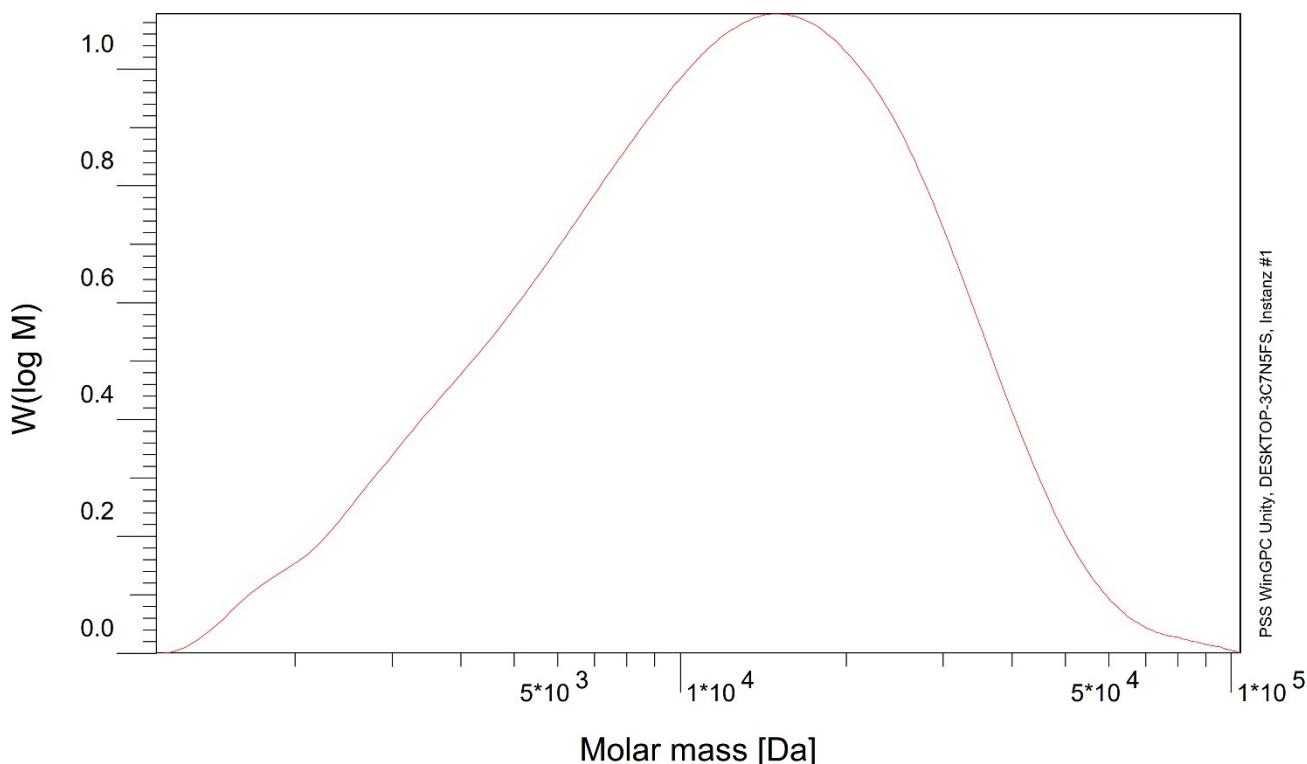


Probe :	Vial 1: DM-FPU1	
Integration von :	Mittwoch 04/09/19 09:58:17	18.618 ml
Integration bis :	Mittwoch 04/09/19 10:12:39	25.770 ml
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	28.828 ml	28.932 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	1.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	1.3102e4	g/mol
Mw :	2.5264e4	g/mol
Mz :	3.8410e4	g/mol
Mv :	0.000000	g/mol
D :	1.9283e0	
[n]:	0.000000	ml/g
Vp :	2.1944e1	ml
Mp :	2.2313e4	g/mol
FI :	4.1471e3	ml*V
< 1107	0.00	
w% :	100.00	
> 142113	0.00	

Figure 12 GPC Profile of DM-FPU1

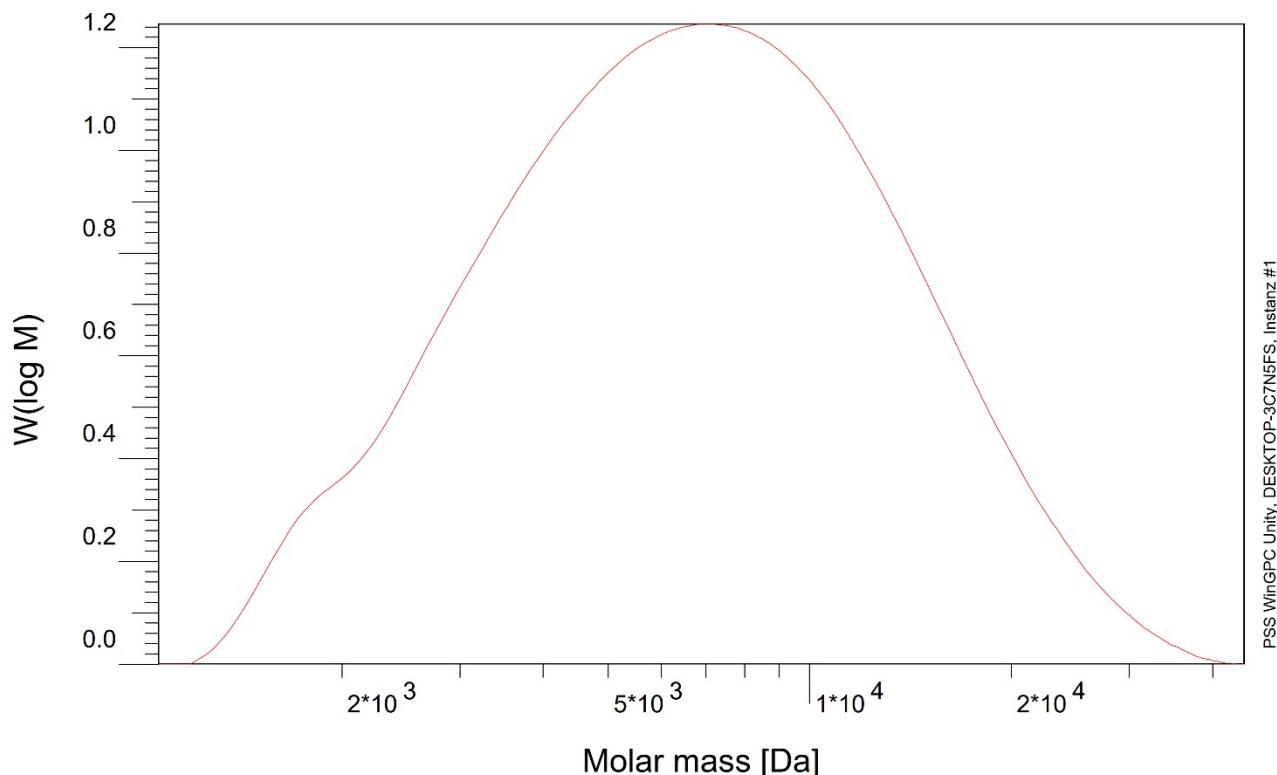


Probe :	Vial 2: DM-FPU2		
Integration von :	Mittwoch 04/09/19 11:05:44	19.237 ml	
Integration bis :	Mittwoch 04/09/19 11:18:49	25.758 ml	
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL		
MHK - A (Kal.):	0.000E+0	Eluent :	DMF
Int.Stand.-K :	28.828 ml	MHK - K (Kal.):	1.000E+0 ml/g
Pumpe :	Agilent 1200 Infinity	Int.Stand.-M :	28.924 ml
Konzentration :	824000.000 g/l	Flußrate :	0.500 ml/min
Säule 1 :	PSS GRAM 5µm 100	Injektvolumen :	20.000 µl
Säule 2 :	PSS GRAM 5µm 3000	Temperatur :	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Temperatur :	23.000 C
Detektor 2 :	I3: DAD 1, Signal A	Versatz :	0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz :	0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz :	0.000 ml
Operateur :	GPC	Messintervall :	1.000 sec

I3: RID 1, RI Signal

Mn :	8.3820e3	g/mol
Mw :	1.5783e4	g/mol
Mz :	2.5344e4	g/mol
Mv :	0.000000	g/mol
D :	1.8829e0	
[n]:	0.000000	ml/g
Vp :	2.2649e1	ml
Mp :	1.3545e4	g/mol
FI :	4.3329e3	ml*V
< 1118	0.00	
w% :	100.00	
> 103942	0.00	

Figure S13 GPC Profile of DM-FPU2

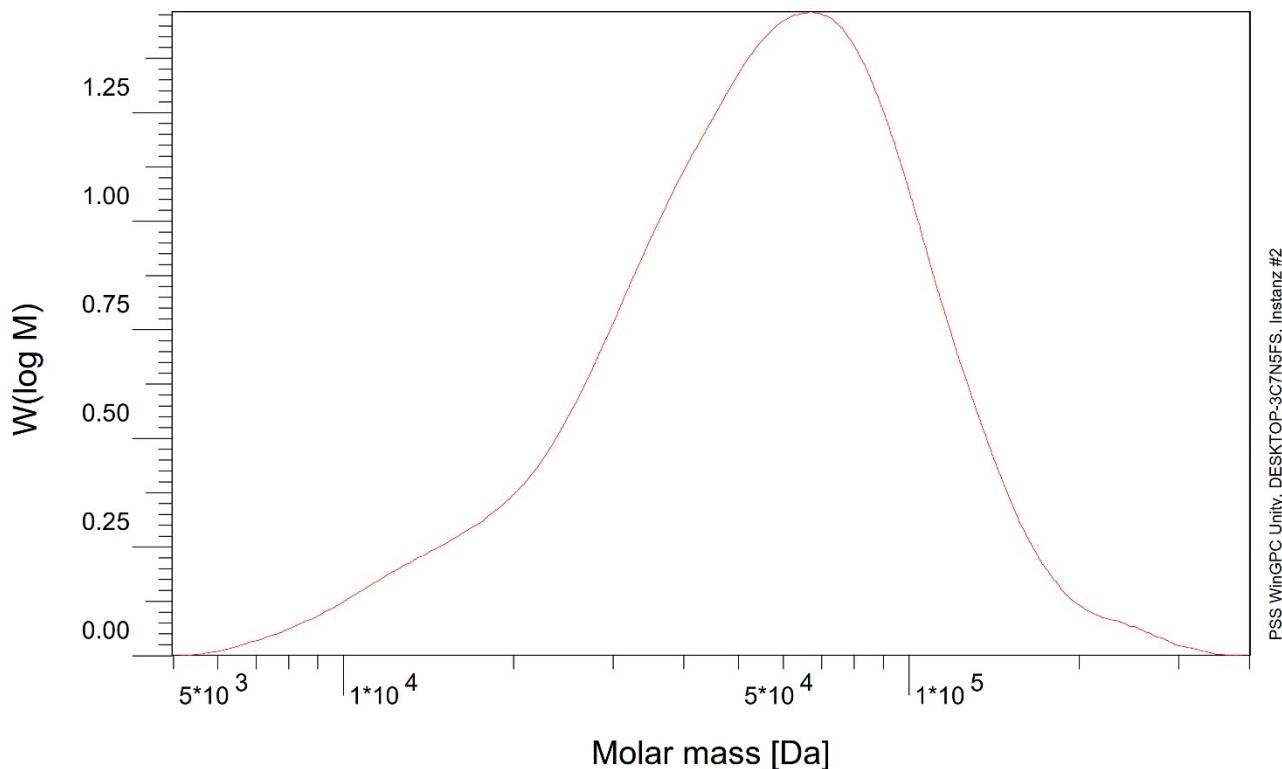


Probe :	Vial 3: DM-FU	
Integration von :	Mittwoch 04/09/19 12:15:08	20.833 ml
Integration bis :	Mittwoch 04/09/19 12:25:09	25.821 ml
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	28.828 ml	28.918 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	824000.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	5.2806e3	g/mol
Mw :	8.2191e3	g/mol
Mz :	1.2127e4	g/mol
Mv :	0.000000	g/mol
D :	1.5565e0	
[n]:	0.000000	ml/g
Vp :	2.3545e1	ml
Mp :	6.7557e3	g/mol
FI :	4.1203e3	ml*V
< 1062	0.00	
w% :	100.00	
> 44595	0.00	

Figure S14 GPC Profile of DM-FU

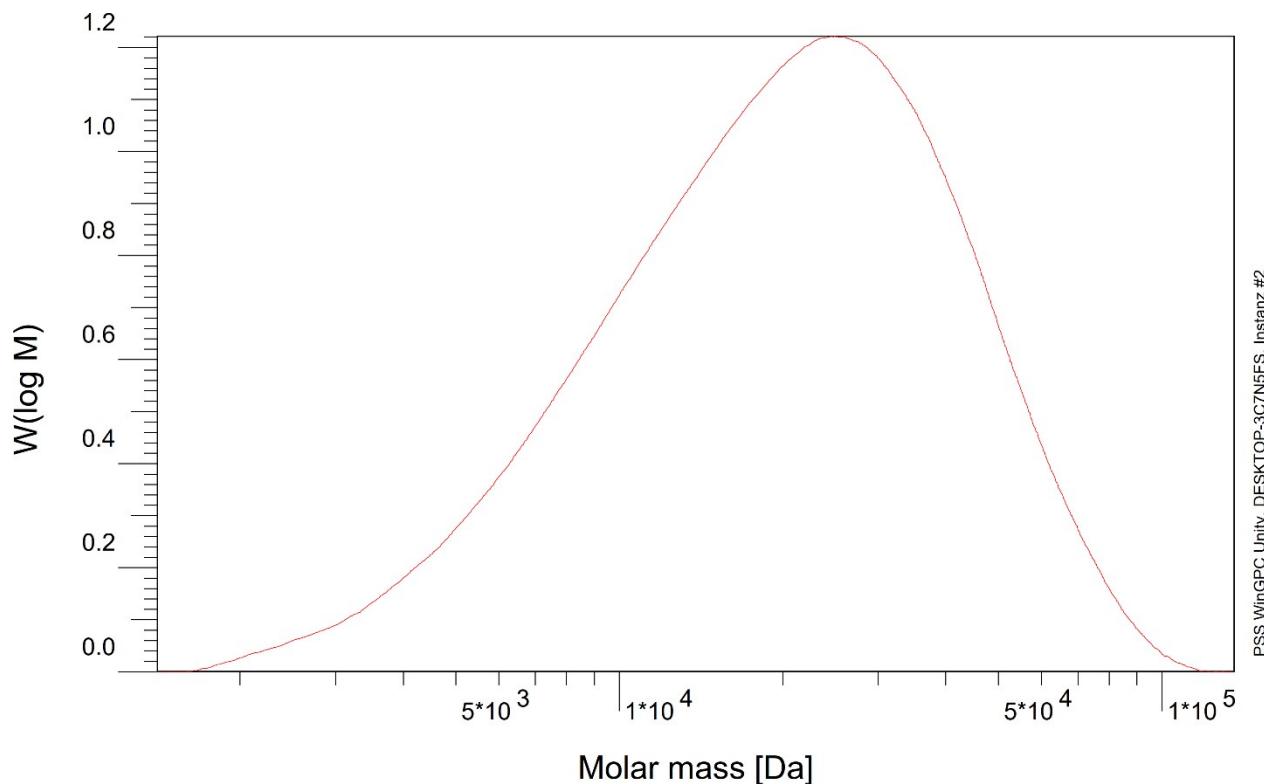


Probe :	Vial 10: DMH-PU	
Integration von :	Mittwoch 07/08/19 19:19:21	16.748 ml
Integration bis :	Mittwoch 07/08/19 19:33:40	23.924 ml
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	28.828 ml	28.785 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	0.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operator :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	4.1946e4	g/mol
Mw :	6.5384e4	g/mol
Mz :	9.2222e4	g/mol
Mv :	0.000000	g/mol
D :	1.5588e0	
[n]:	0.000000	ml/g
Vp :	2.0240e1	ml
Mp :	6.1940e4	g/mol
FI :	3.1149e3	ml*V
< 4966	0.00	
w% :	100.00	
> 400974	0.00	

Figure S15 GPC Profile of DMH-PU

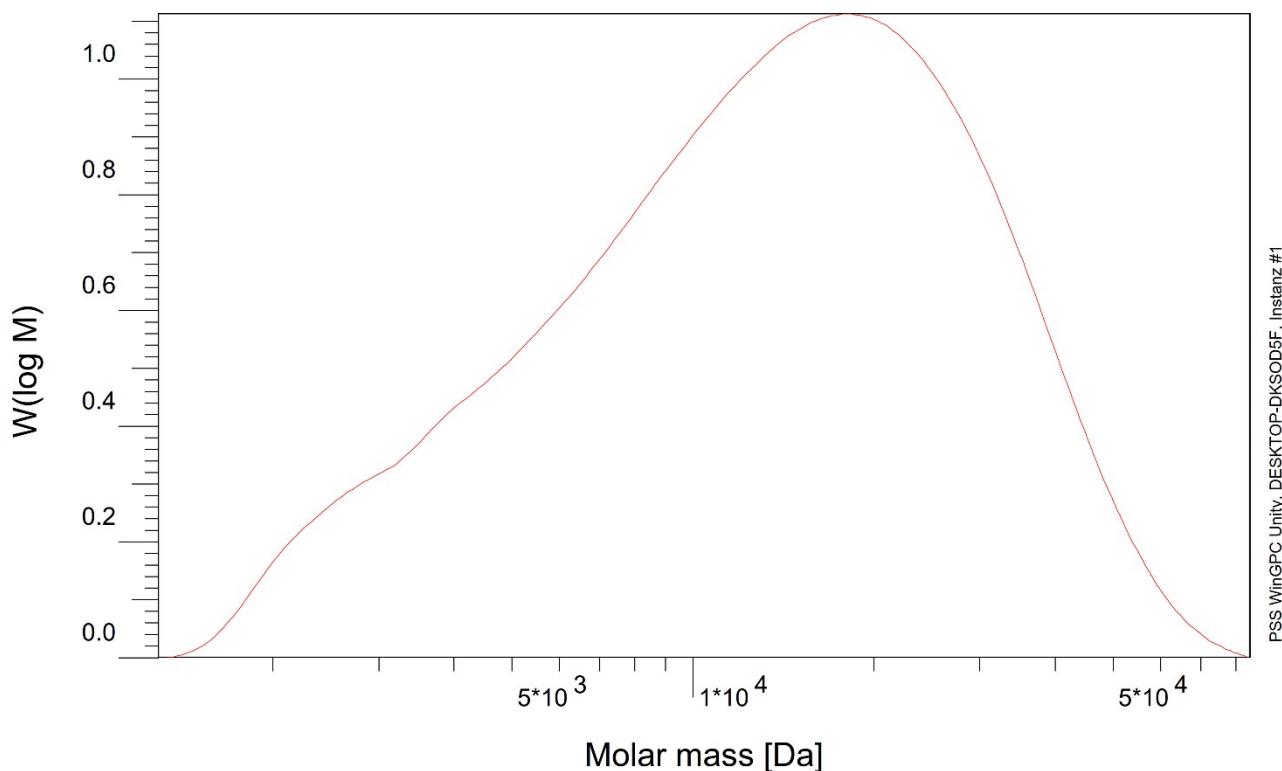


Probe :	Vial 12: DMH-FPU1	
Integration von :	Mittwoch 07/08/19 21:35:44	18.704 ml
Integration bis :	Mittwoch 07/08/19 21:49:15	25.475 ml
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	28.828 ml	28.792 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	0.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	Temperatur : 23.000 C
Säule 2 :	PSS GRAM 5µm 3000	Temperatur : 23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	1.4212e4	g/mol
Mw :	2.4694e4	g/mol
Mz :	3.6602e4	g/mol
Mv :	0.000000	g/mol
D :	1.7376e0	
[n]:	0.000000	ml/g
Vp :	2.1911e1	ml
Mp :	2.2820e4	g/mol
FI :	3.4177e3	ml*V
< 1406	0.00	
w% :	100.00	
> 136052	0.00	

Figure S16 GPC Profile of DMH-FPU1

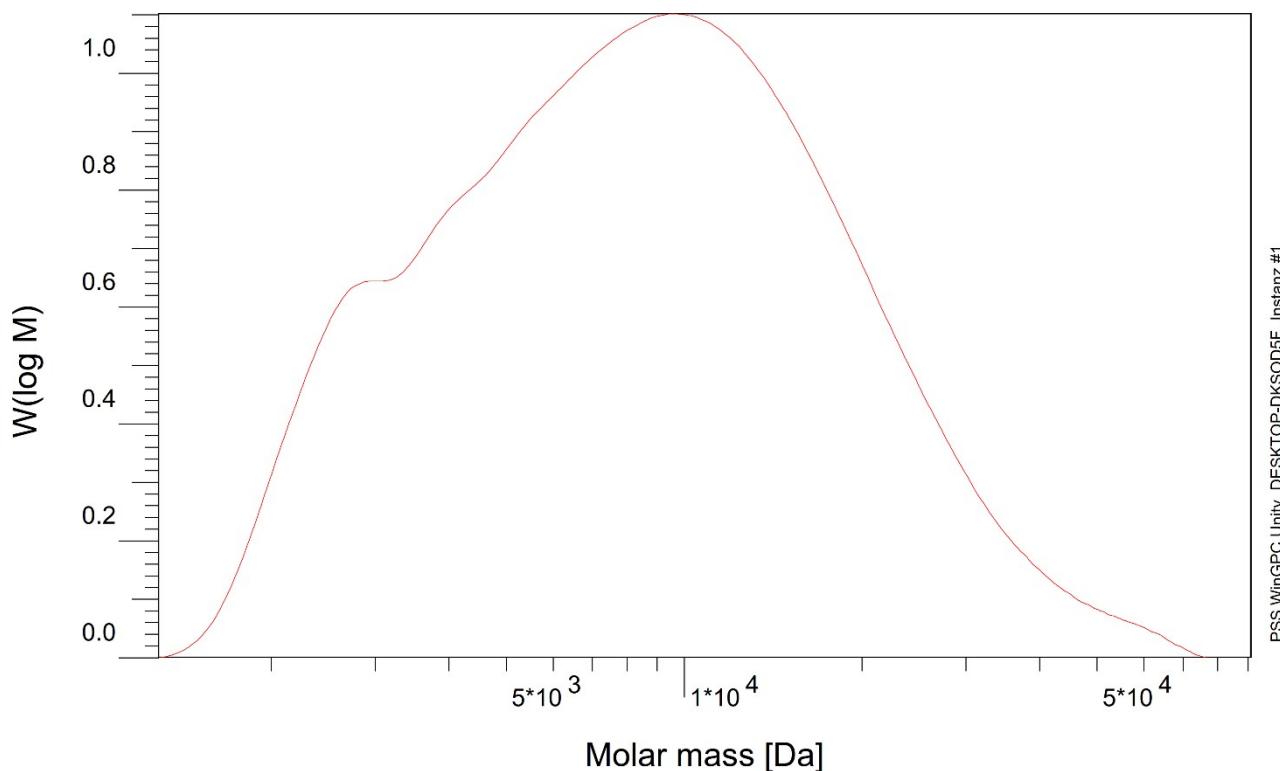


Probe :	Vial 3: DMH-FPU2	
Integration von :	Mittwoch 21/08/19 13:00:52	19.646 ml
Integration bis :	Mittwoch 21/08/19 13:12:45	25.585 ml
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	28.828 ml	28.849 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	824000.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	9.0413e3	g/mol
Mw :	1.7000e4	g/mol
Mz :	2.6162e4	g/mol
Mv :	0.000000	g/mol
D :	1.8803e0	
[n]:	0.000000	ml/g
Vp :	2.2441e1	ml
Mp :	1.5768e4	g/mol
FI :	4.1124e3	ml*V
< 1287	0.00	
w% :	100.00	
> 84476	0.00	

Figure S17 GPC Profile of DMH-FPU2



Probe :	Vial 2: DMH-FU	
Integration von :	Mittwoch 21/08/19 11:54:21	19.497 ml
Integration bis :	Mittwoch 21/08/19 12:06:32	25.585 ml
Kalibration :	DMF+LiBr_PS_0,5_20190807.CAL	DMF
MHK - A (Kal.):	0.000E+0	1.000E+0 ml/g
Int.Stand.-K :	28.828 ml	28.849 ml
Pumpe :	Agilent 1200 Infinity	0.500 ml/min
Konzentration :	824000.000 g/l	20.000 ul
Säule 1 :	PSS GRAM 5µm 100	23.000 C
Säule 2 :	PSS GRAM 5µm 3000	23.000 C
Detektor 1 :	I3: RID 1, RI Signal	Versatz : 0.000 ml
Detektor 2 :	I3: DAD 1, Signal A	Versatz : 0.000 ml
Detektor 3 :	I3: DAD 1, Signal B	Versatz : 0.000 ml
Detektor 4 :	I3: IsoPump 1, Pressure	Versatz : 0.000 ml
Operateur :	GPC	Messintervall : 1.000 sec

I3: RID 1, RI Signal

Mn :	6.2480e3	g/mol
Mw :	1.1102e4	g/mol
Mz :	1.8902e4	g/mol
Mv :	0.000000	g/mol
D :	1.7768e0	
[n]:	0.000000	ml/g
Vp :	2.3190e1	ml
Mp :	8.9533e3	g/mol
FI :	4.8270e3	ml*V
< 1286	0.00	
w% :	100.00	
> 91140	0.00	

Figure S18 GPC Profile of DMH-FU