Supporting Information for

Surfactant-free preparation of poly(vinylidene fluoride) nanoparticle dispersions and their use as surface coating agents

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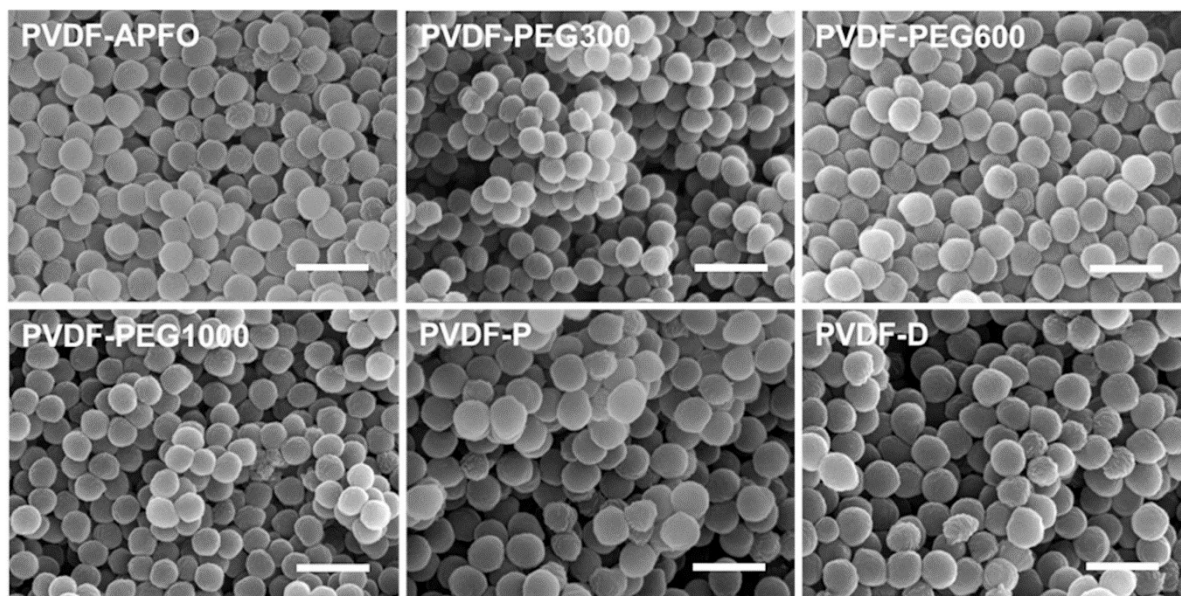[*]Corresponding author: Phone: +82 42 860 7943, Fax: +82 42 860 7048, E-mail:inseh98@krict.re.kr.

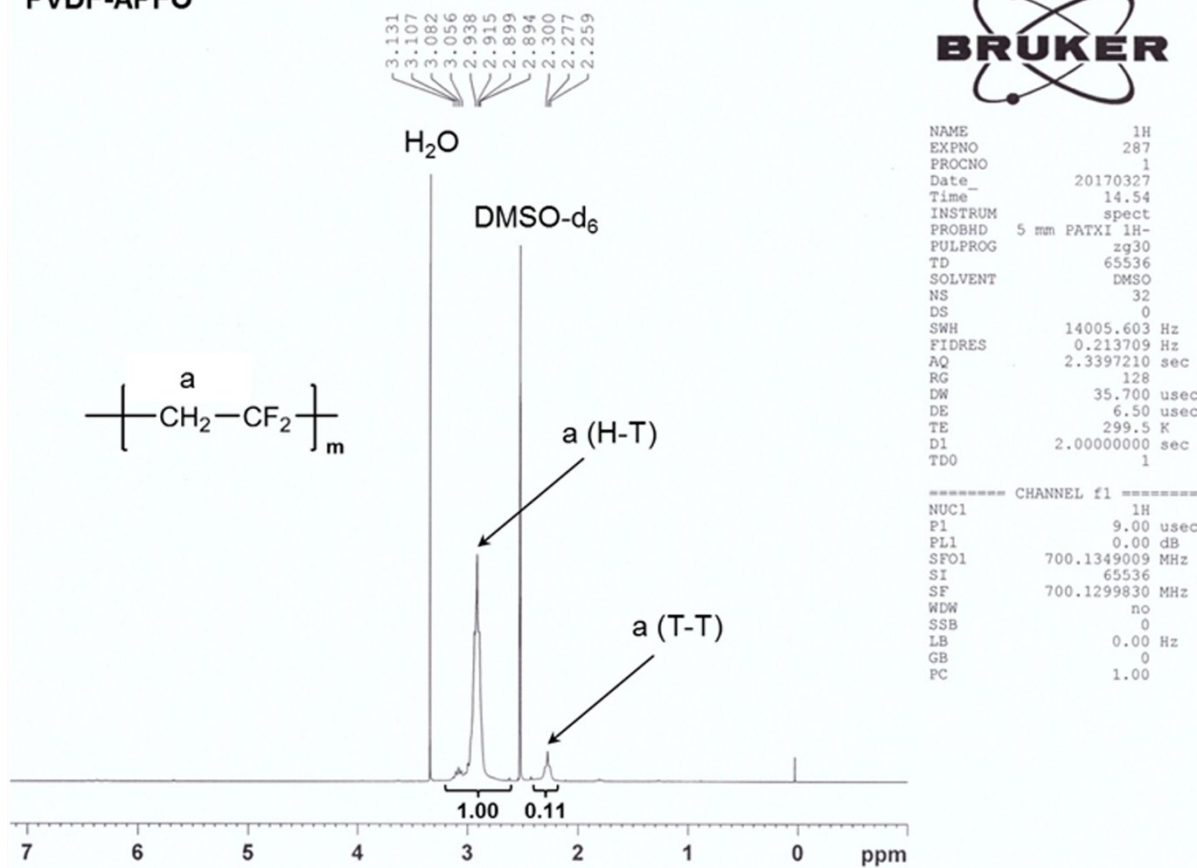Figure S1. SEM images of PVDF latex nanoparticles (scale bar = 500 nm).

Figure S2. ^{1}H NMR spectra of PVDF latex nanoparticles obtained using APFO.

PVDF-PEG300

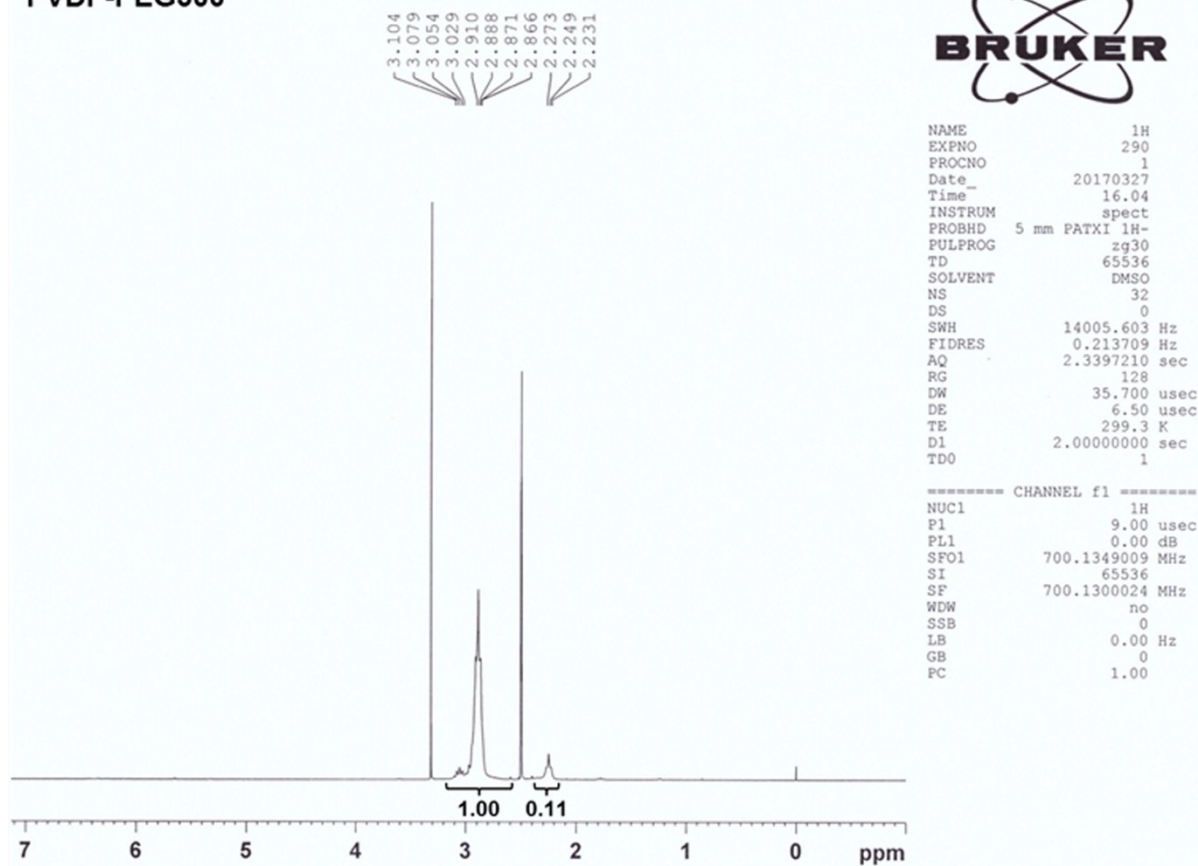3.104
3.079
3.054
3.029
2.910
2.888
2.871
2.866
2.273
2.249
2.231

NAME   1H
EXPNO   290
PROCNO   1
Date_   20170327
Time   16.04
INSTRUM   spect
PROBHD   5 mm PATXI 1H-
PULPROG   zg30
TD   65536
SOLVENT   DMSO
NS   32
DS   0
SWH   14005.603 Hz
FIDRES   0.213709 Hz
AQ   2.3397210 sec
RG   128
DW   35.700 usec
DE   6.50 usec
TE   299.3 K
D1   2.00000000 sec
TD0   1

======== CHANNEL f1 ========
NUC1   1H
P1   9.00 usec
PL1   0.00 dB
SFO1   700.1349009 MHz
SI   65536
SF   700.1300024 MHz
WDW   no
SSB   0
LB   0.00 Hz
GB   0
PC   1.00

1.00   0.11

7   6   5   4   3   2   1   0   ppm

Figure S3. ^{1}H NMR spectra of PVDF latex nanoparticles obtained using PEG300.

4

PVDF-PEG600

3.104
3.079
3.054
3.030
2.910
2.888
2.872
2.866
2.271
2.249
2.231

NAME   1H
EXPNO   291
PROCNO   1
Date_   20170327
Time   17.29
INSTRUM   spect
PROBHD   5 mm PATXI 1H-
PULPROG   zg30
TD   65536
SOLVENT   DMSO
NS   32
DS   0
SWH   14005.603 Hz
FIDRES   0.213709 Hz
AQ   2.3397210 sec
RG   128
DW   35.700 usec
DE   6.50 usec
TE   299.4 K
D1   2.00000000 sec
TDO   1

======== CHANNEL f1 ========
NUC1   1H
P1   9.00 usec
PL1   0.00 dB
SFO1   700.1349009 MHz
SI   65536
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WDW   no
SSB   0
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PC   1.00

1.00   0.11
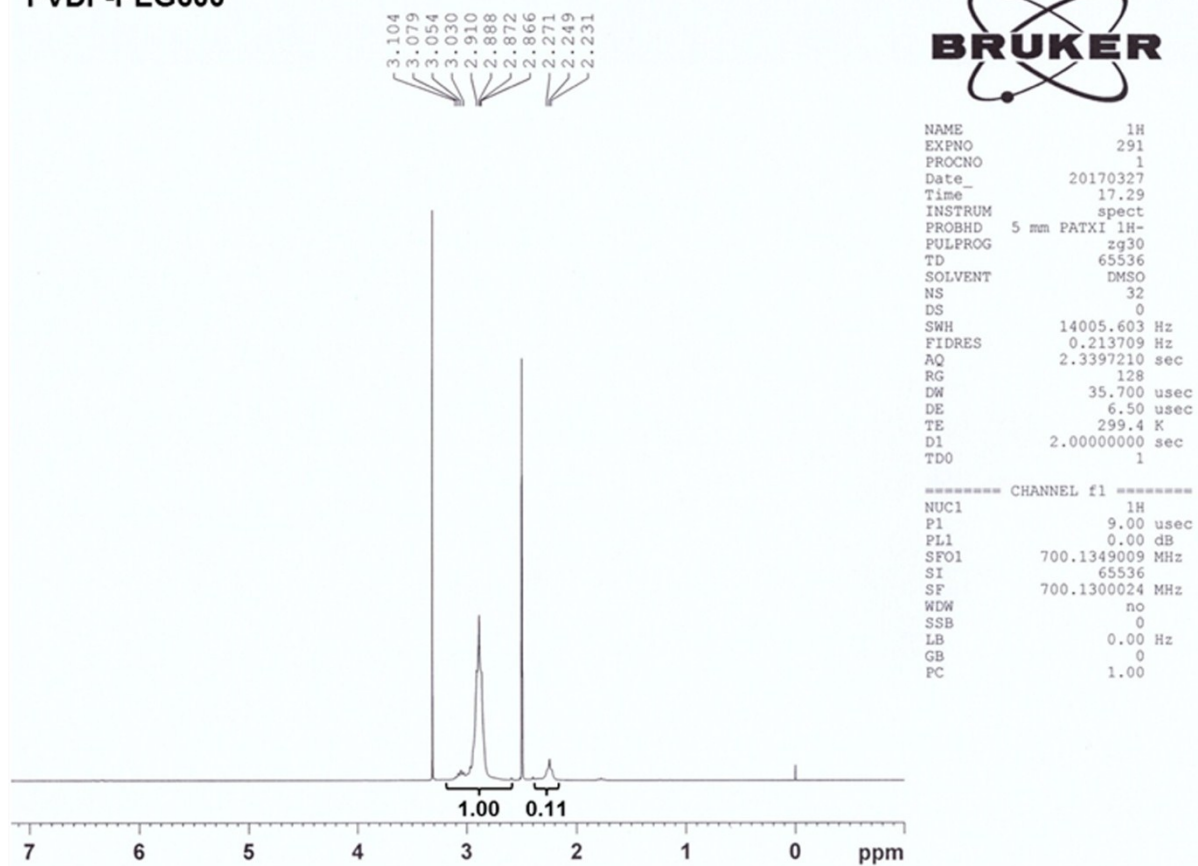
Figure S4. ¹H NMR spectra of PVDF latex nanoparticles obtained using PEG600.
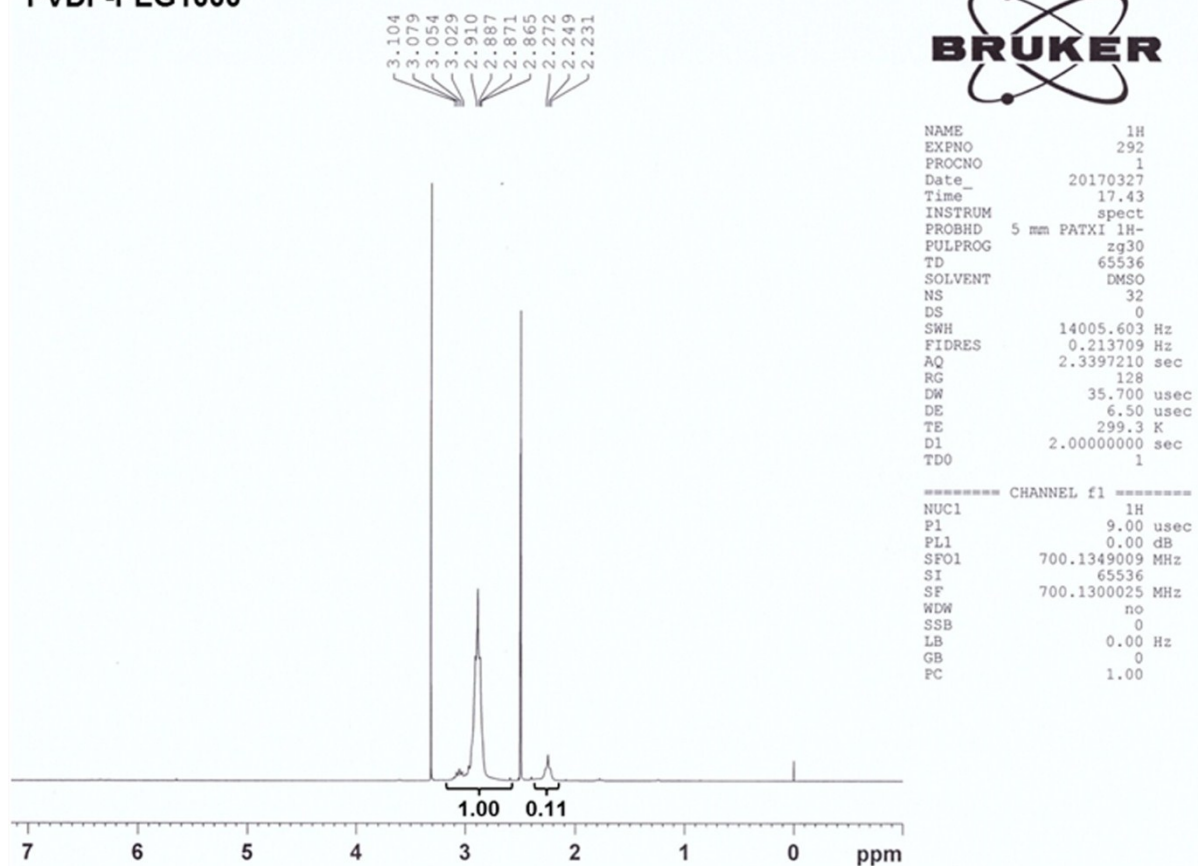
Figure S5. ^{1}H NMR spectra of PVDF latex nanoparticles obtained using PEG1000.

PVDF-P

3.097
3.062
3.026
2.922
2.891
2.860
2.249
2.223
1.817
1.779
1.740

1.00 0.13

7   6   5   4   3   2   1   0   ppm
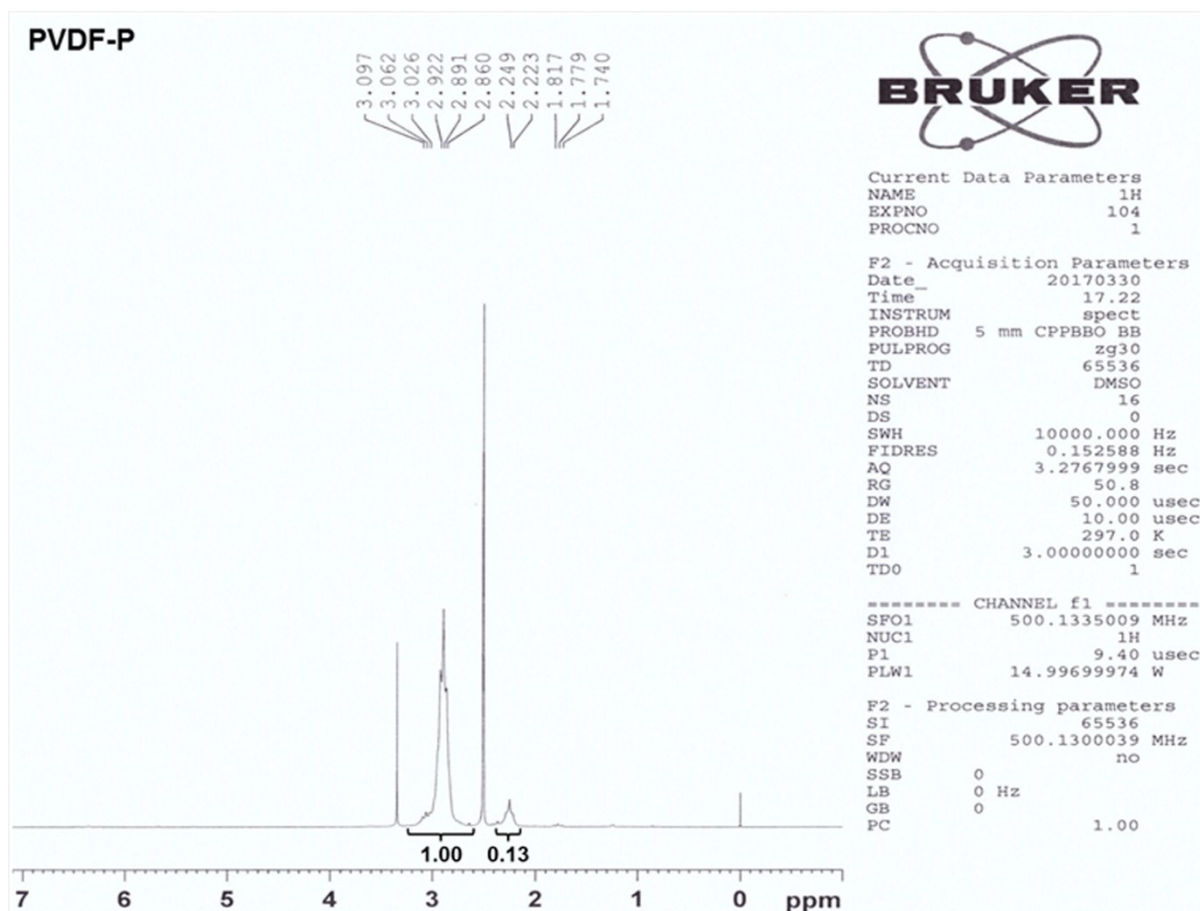
Figure S6. ^{1}H NMR spectra of PVDF latex nanoparticles obtained using PVDF nanoparticles.
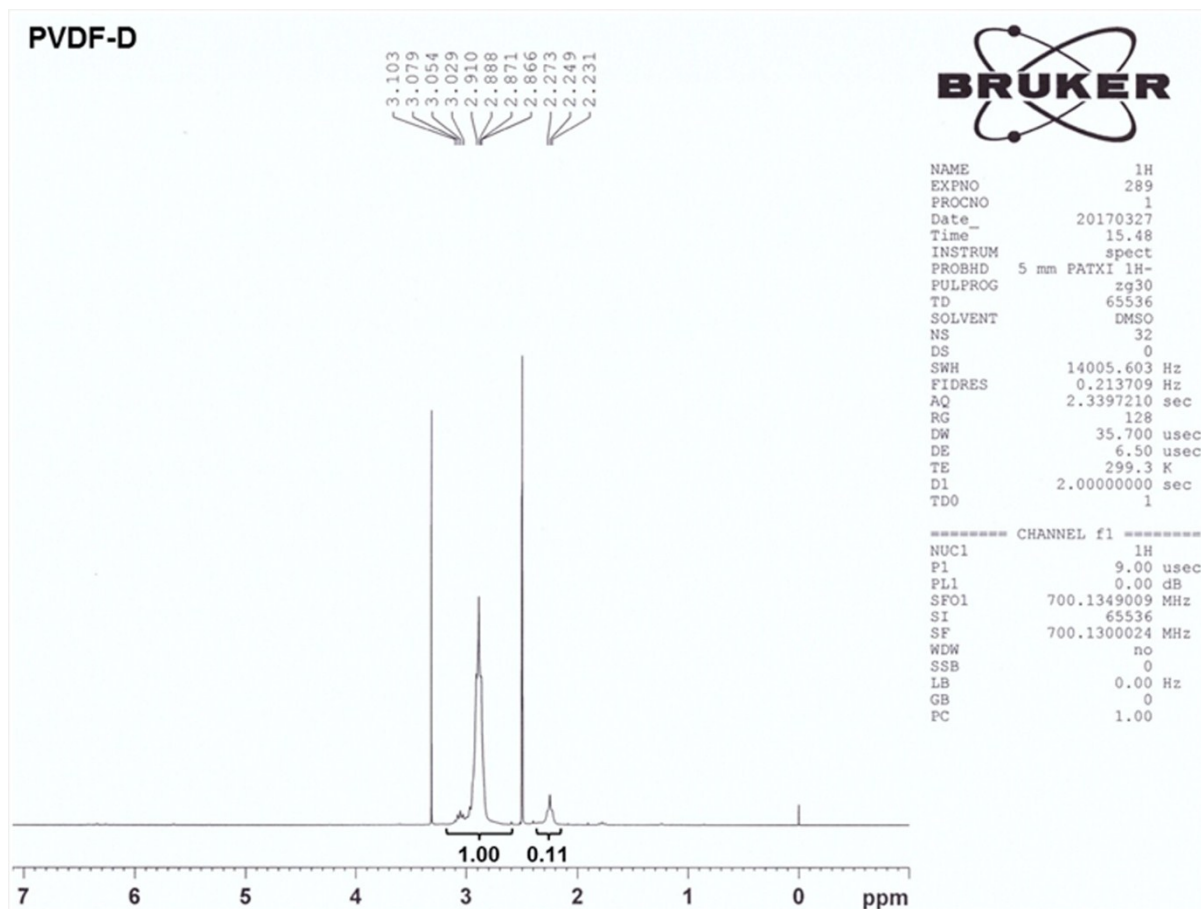
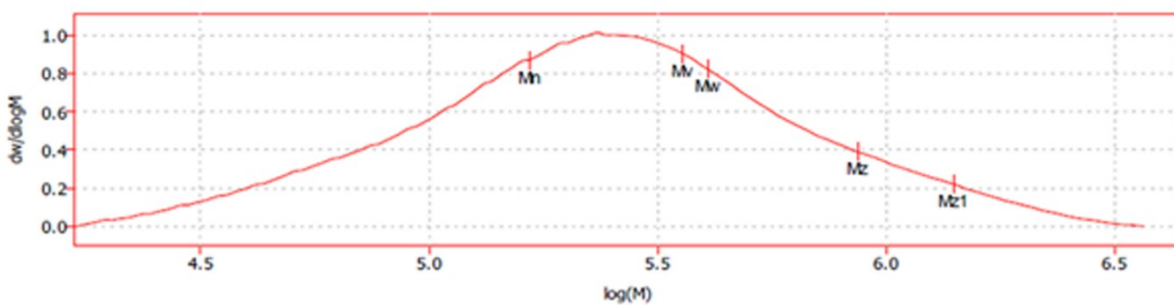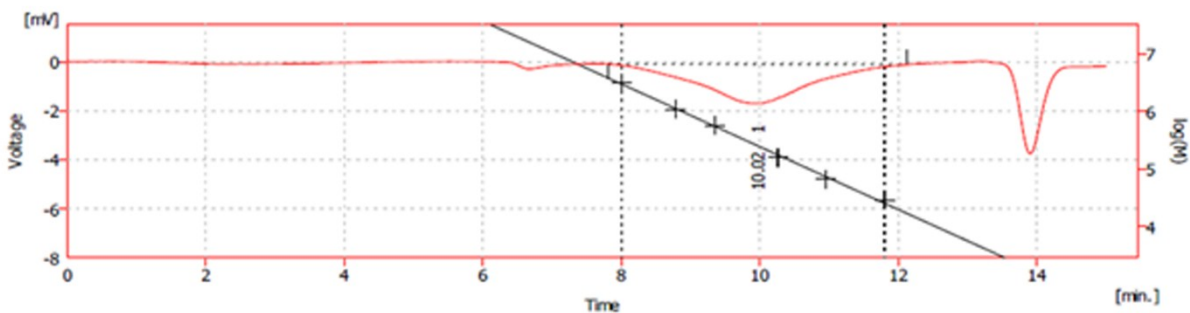Figure S7. ^{1}H NMR spectra of PVDF latex nanoparticles obtained using diluted PVDF dispersion.

Clarity GPC Report

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PVDF-APFO

Sample Info:
Sample ID   :
Sample   :
Inj. Volume [mL]   : 0
K   : 14.1

Amount   : 0
ISTD Amount : 0
Dilution   : 1
Alpha   : 0.7

Result Table (test91(flow-0.8, with LiBr, 1st calum) - Narrow Universal Flow Rate Corr. - YL9100GPC - 2017-04-04 4_08_50 - RID)
Equation: Y = - 0.54604*X + 10.8413
Correlation Factor: 0.9986525

	Max. RT	Start RT	End RT	Mn	Mw	Mv	PD
1	10.02	7.82	12.13	166396	408403	359247	2.4544

Figure S8. GPC result of PVDF latex nanoparticles obtained using APFO.

Clarity GPC Report   PVDF-PEG300

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Sample Info:
Sample ID   :
Sample   :
Inj. Volume [mL] : 0
K   : 14.1

Amount   : 0
ISTD Amount : 0
Dilution   : 1
Alpha   : 0.7
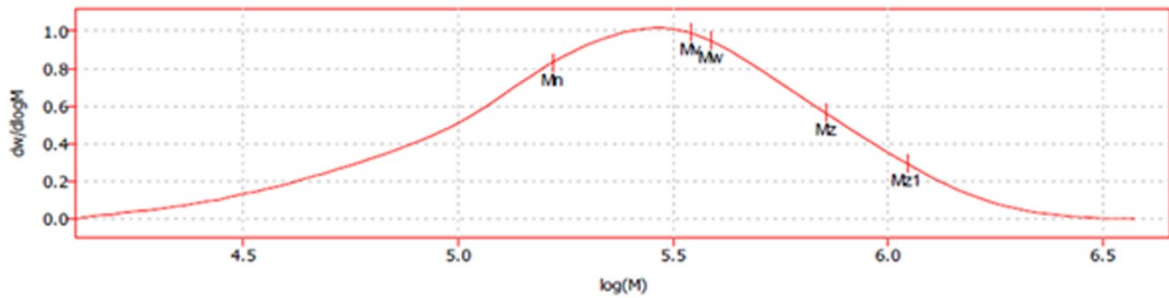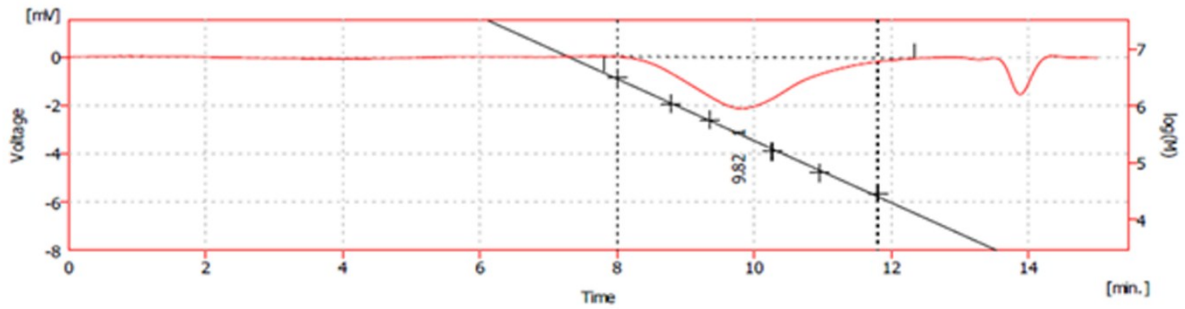
Result Table (test91(flow-0.8, with LiBr, 1st calum) - Narrow Universal Flow Rate Corr. - YL9100GPC - 2017-04-04 4_42_38 - RID)
Equation: Y = - 0.54604*X + 10.8413
Correlation Factor: 0.9986525

	Max. RT	Start RT	End RT	Mn	Mw	Mv	PD
1	9.82	7.80	12.33	166132	387468	348086	2.3323

Figure S9. GPC result of PVDF latex nanoparticles obtained using PEG300.
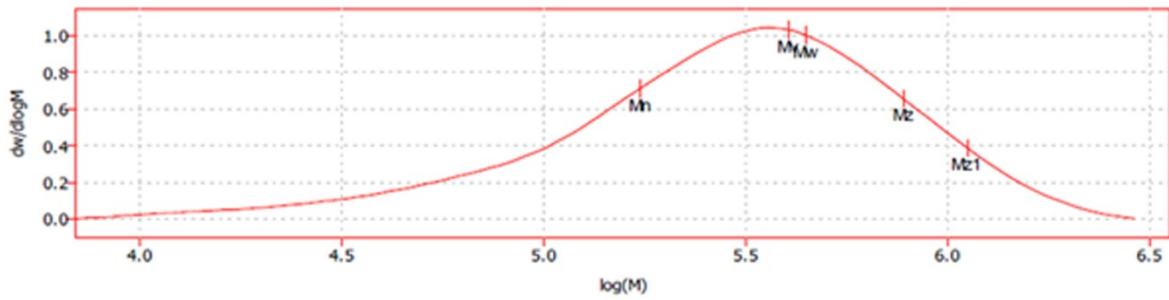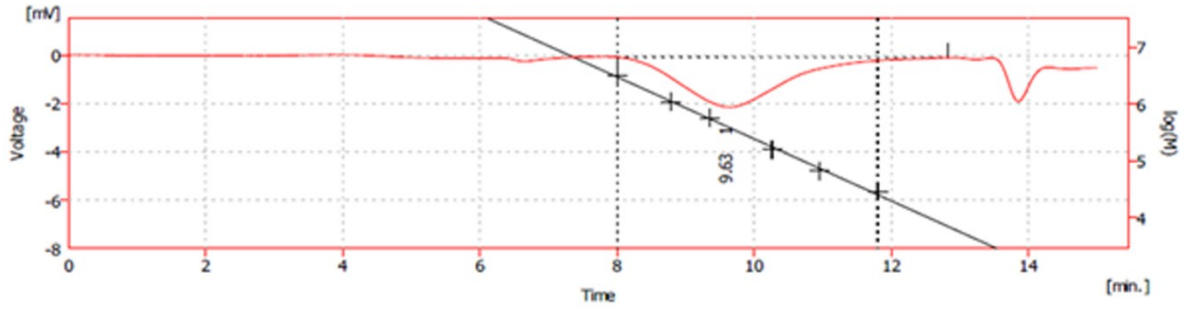
Figure S10. GPC result of PVDF latex nanoparticles obtained using PEG600.

Clarity GPC Report PVDF-PEG1000

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Sample Info:

Sample ID	:	Amount	: 0
Sample	:	ISTD Amount	: 0
Inj. Volume [mL]	: 0	Dilution	: 1
K	: 14.1	Alpha	: 0.7
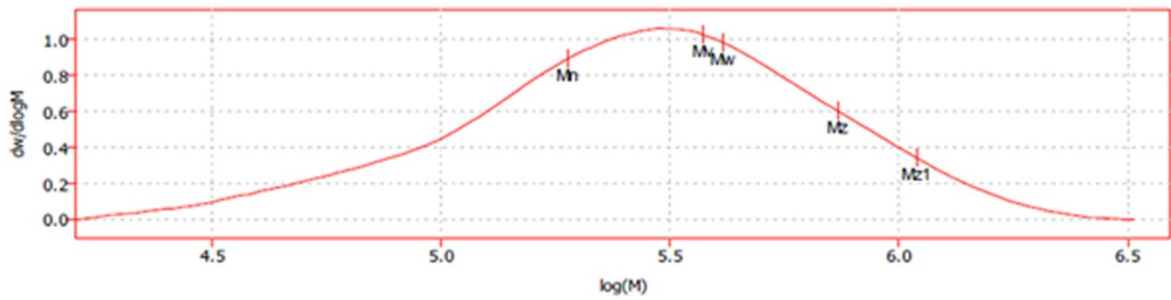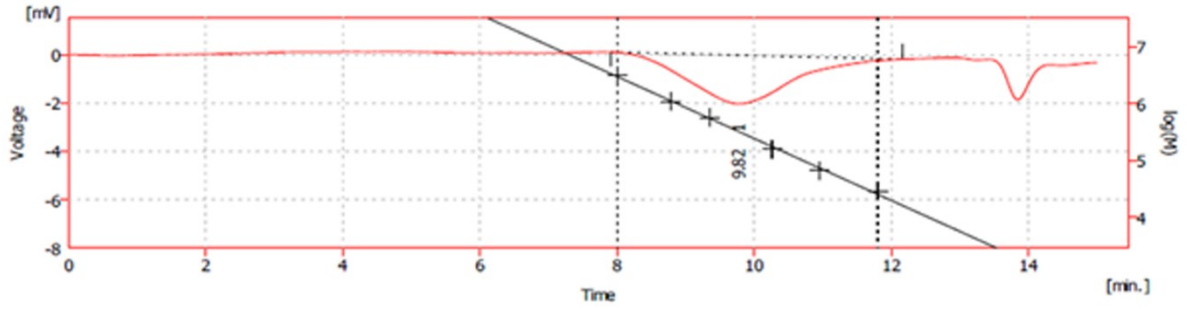
Result Table (test91(flow-0.8, with LiBr, 1st calum) - Narrow Universal Flow Rate Corr. - YL9100GPC - 2017-04-04 9_56_52 - RID)

Equation: Y = - 0.54604*X + 10.8413

Correlation Factor: 0.9986525

	Max. RT	Start RT	End RT	Mn	Mw	Mv	PD
1	9.82	7.91	12.17	189333	413645	374367	2.1848

Figure S11. GPC result of PVDF latex nanoparticles obtained using PEG1000.

Clarity GPC Report

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Sample Info:

Sample ID	:	Amount	: 0	
Sample	:	ISTD Amount	: 0	
Inj. Volume [mL]	: 0	Dilution	: 1	
K	: 14.1	Alpha	: 0.7	

[mV] / Voltage / Time [min.] / log(M)

9.68

dw/dlogM / log(M)

MwMw
Mn
Mz
Mz1
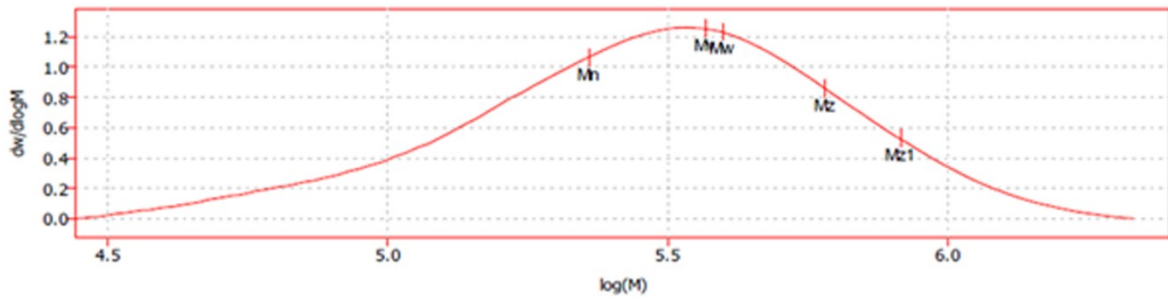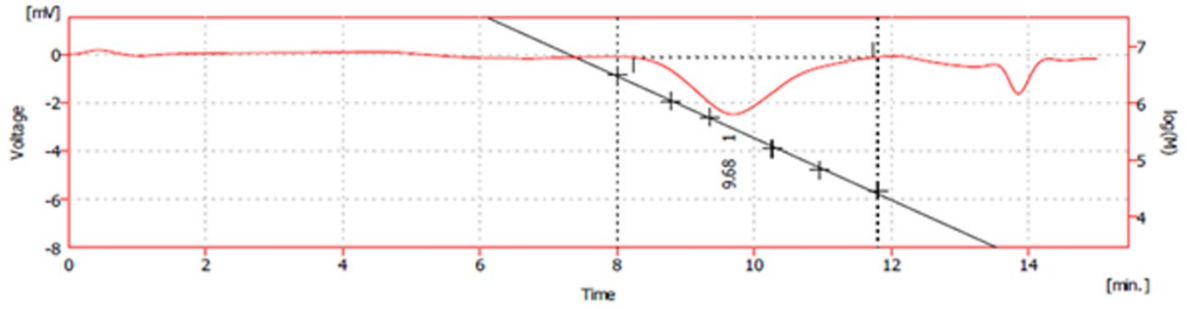
Result Table (test91(flow-0.8, with LiBr, 1st calum) - Narrow Universal Flow Rate Corr. - YL9100GPC - 2017-04-04 11_01_05 - RID)
Equation: Y = - 0.54604*X + 10.8413
Correlation Factor: 0.9986525

	Max. RT	Start RT	End RT	Mn	Mw	Mv	PD
1	9.68	8.24	11.73	228642	396472	369133	1.7340

Figure S12. GPC result of PVDF latex nanoparticles obtained using PVDF nanoparticles.

Clarity GPC Report

PVDF-D

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Sample Info:
- Sample ID :
- Sample :
- Inj. Volume [mL] : 0
- K : 14.1
- Amount : 0
- ISTD Amount : 0
- Dilution : 1
- Alpha : 0.7
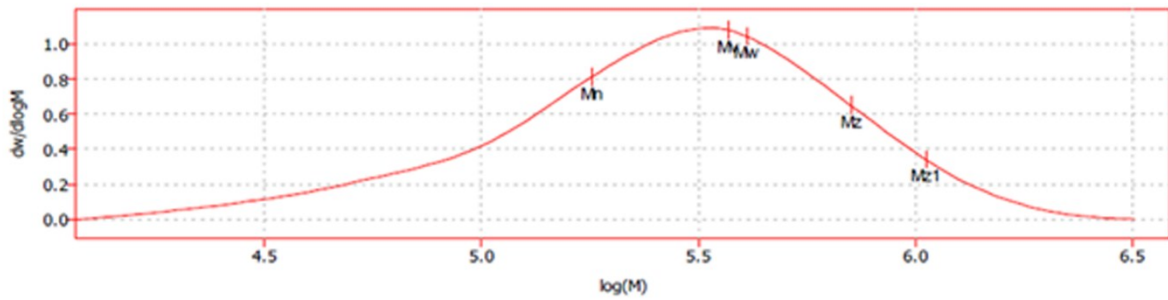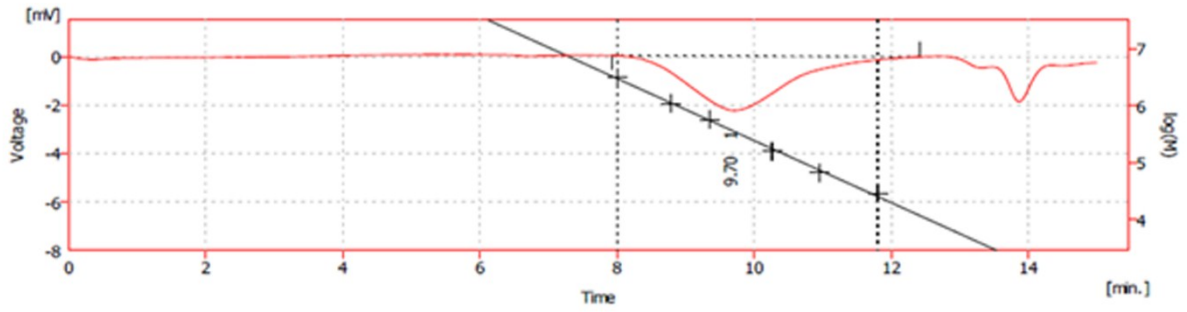
Result Table (test91(flow-0.8, with LiBr, 1st calum) - Narrow Universal Flow Rate Corr. - YL9100GPC - 2017-04-04 11_33_41 - RID)
*Equation: Y = - 0.54604*X + 10.8413*
Correlation Factor: 0.9986525

	Max. RT	Start RT	End RT	Mn	Mw	Mv	PD
1	9.70	7.92	12.42	180321	408935	371171	2.2678

Figure S13. GPC result of PVDF latex nanoparticles obtained using diluted PVDF dispersion.
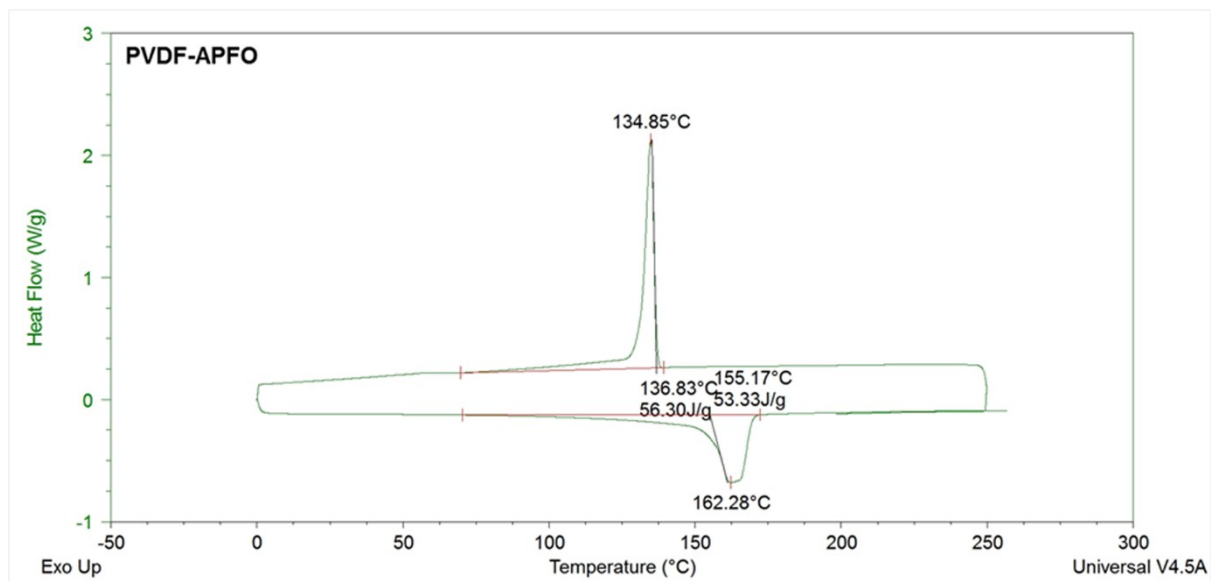
Figure S14. DSC curve of PVDF latex nanoparticles obtained using APFO.
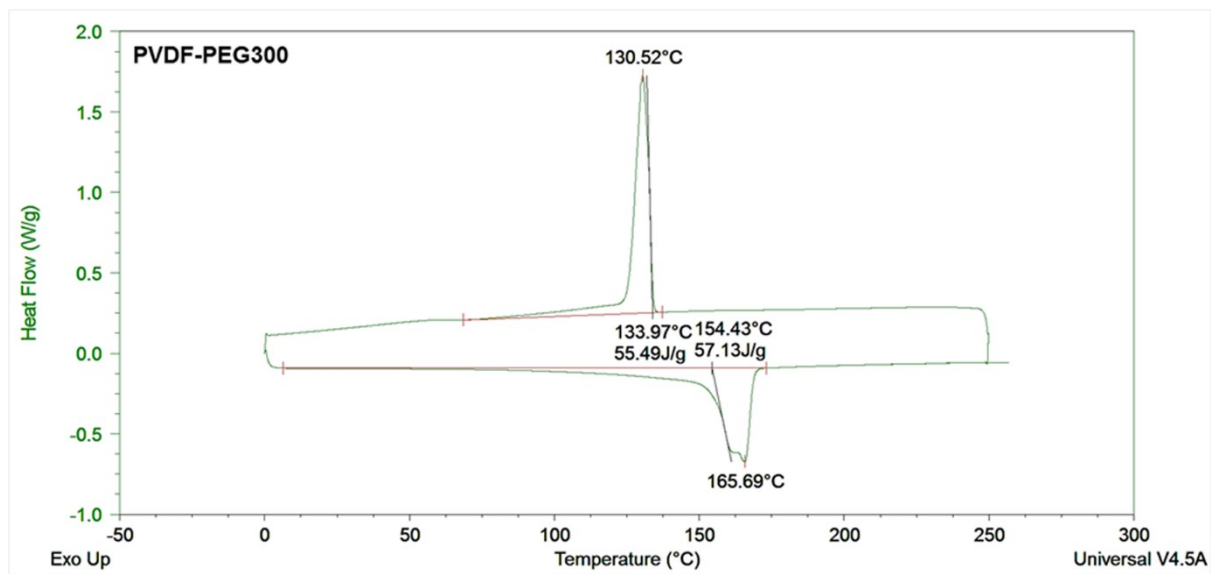
Figure S15. DSC curve of PVDF latex nanoparticles obtained using PEG300.
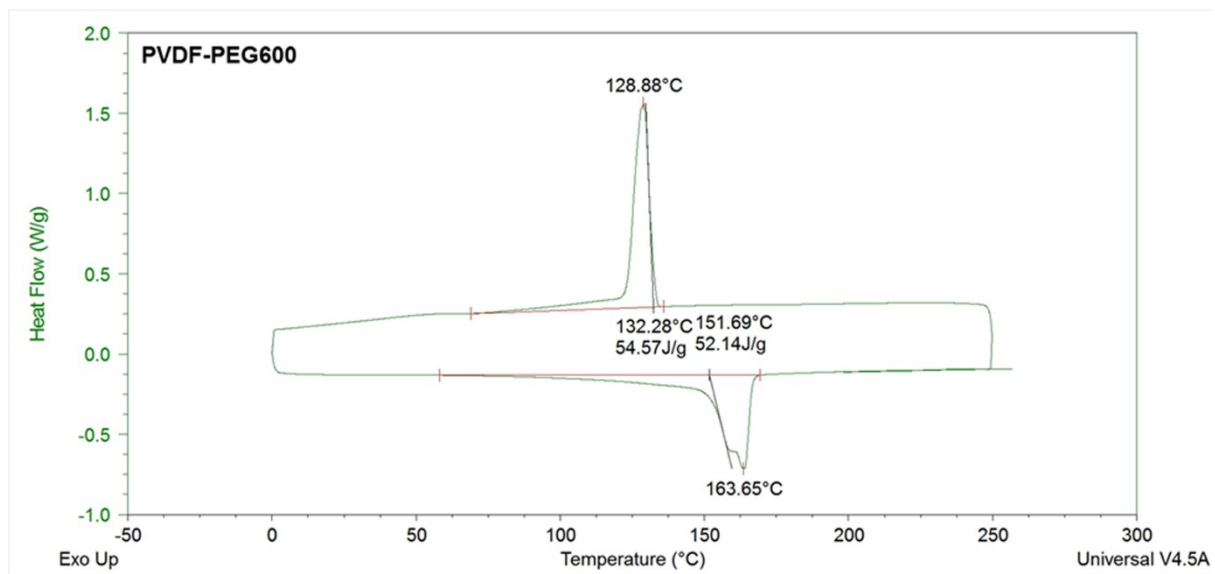
Figure S16. DSC curve of PVDF latex nanoparticles obtained using PEG600.
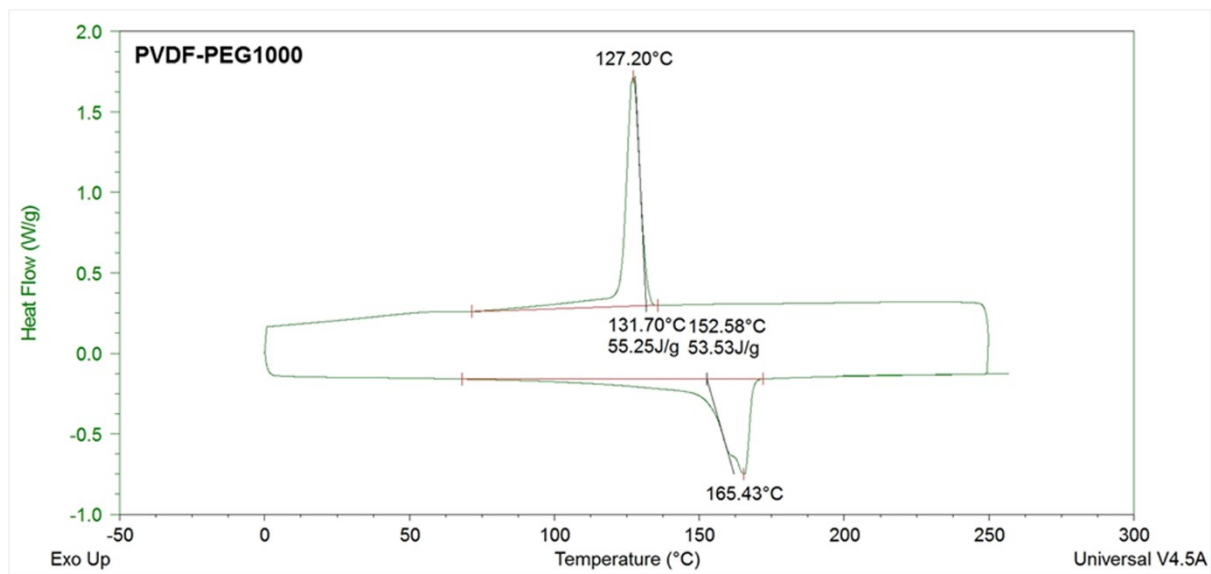
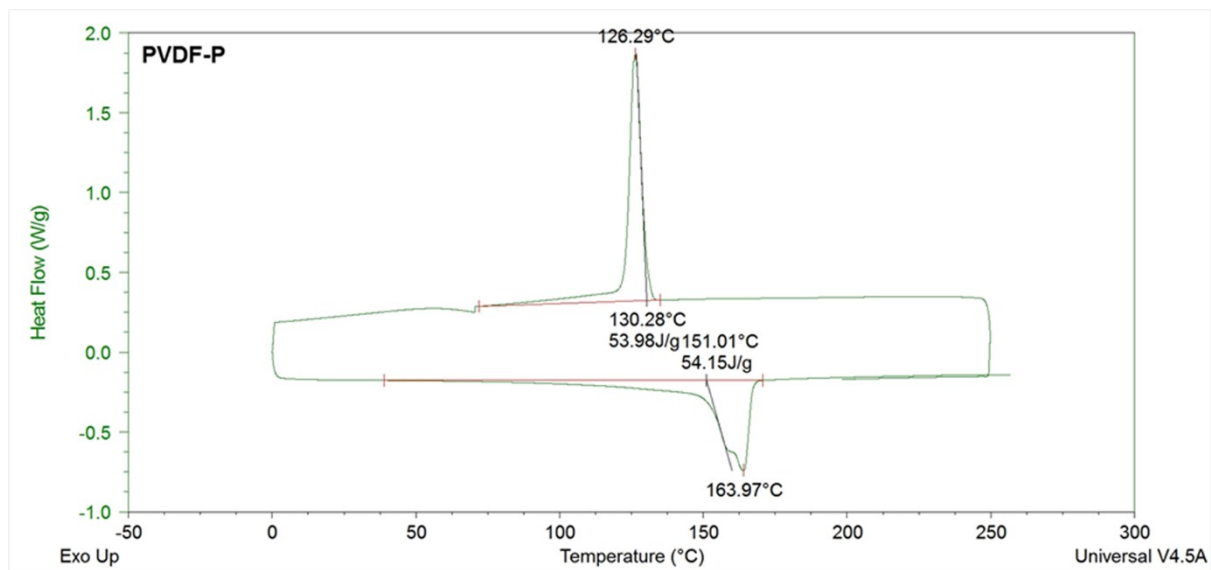Figure S17. DSC curve of PVDF latex nanoparticles obtained using PEG1000.

Figure S18. DSC curve of PVDF latex nanoparticles obtained using PVDF nanoparticles.
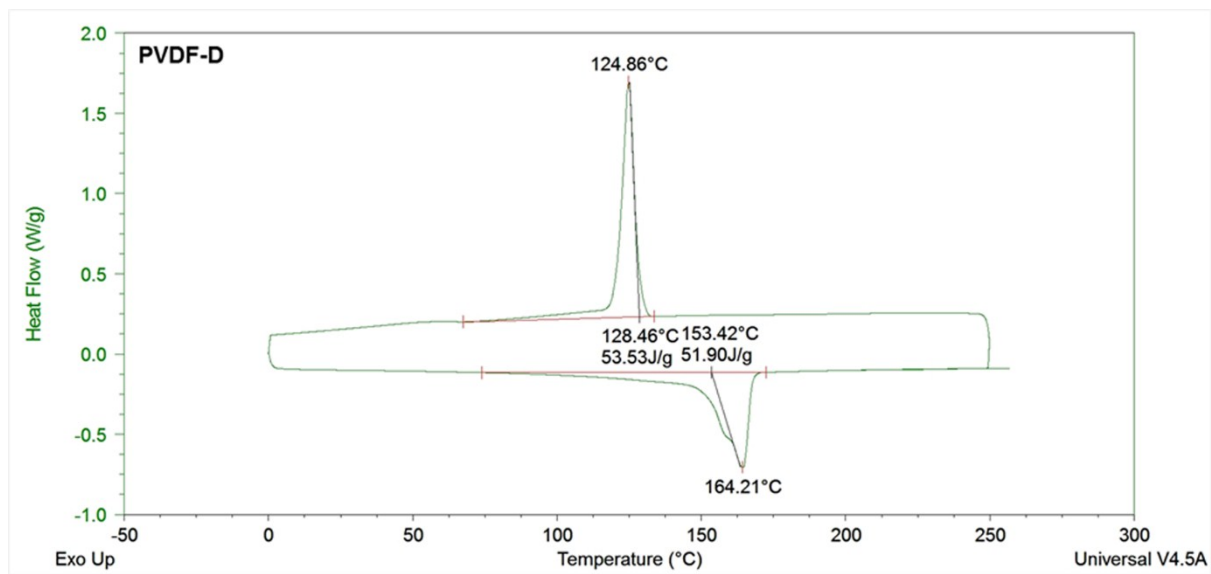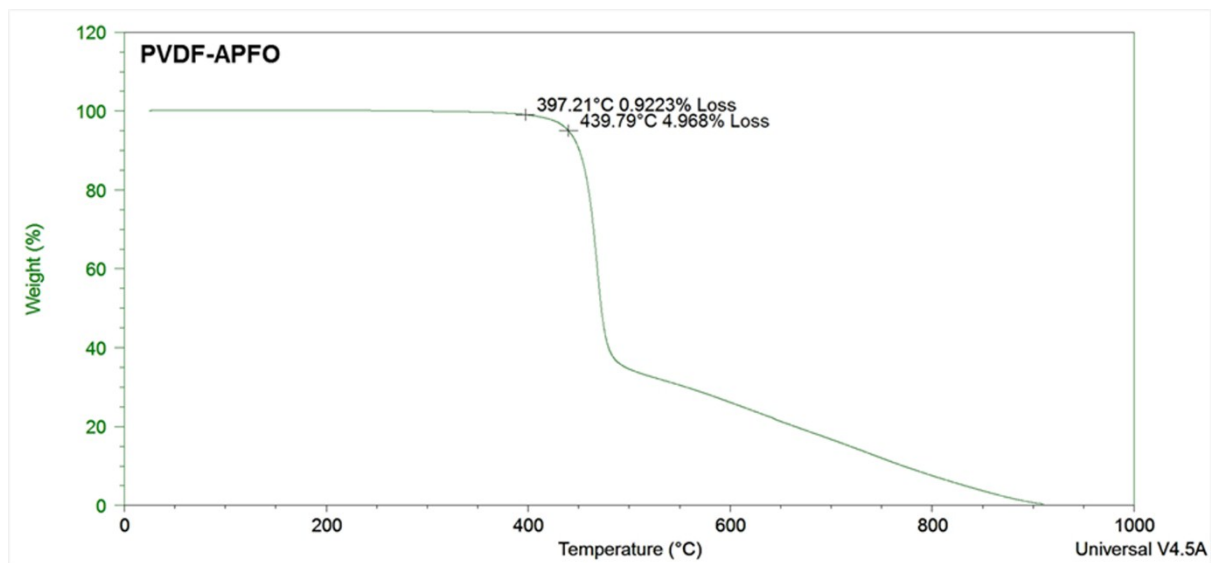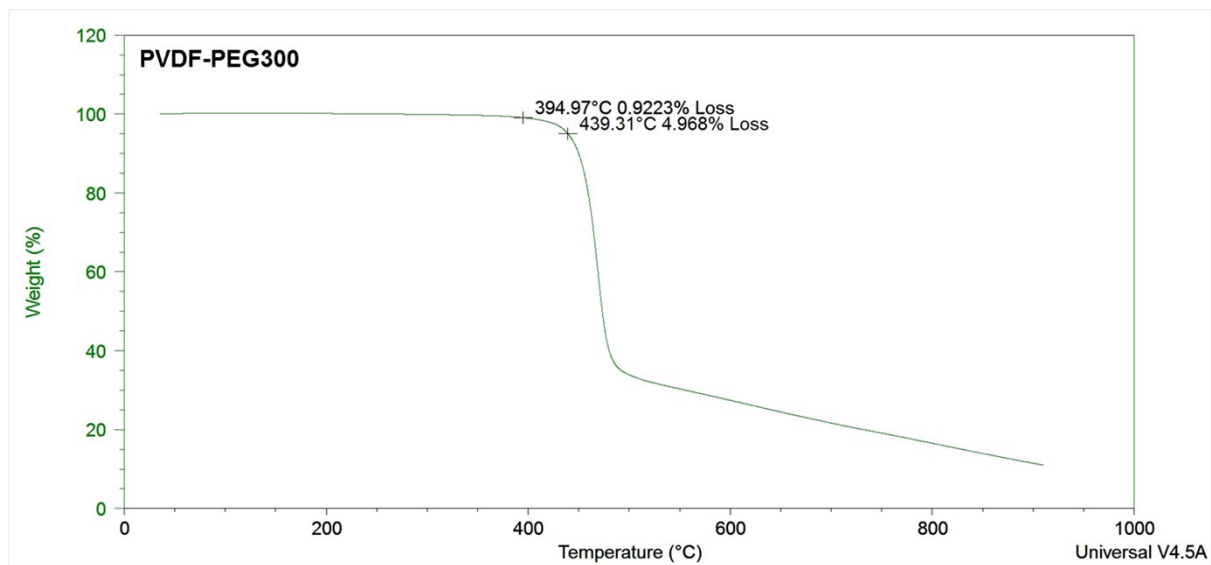
Figure S19. DSC curve of PVDF latex nanoparticles obtained using diluted PVDF dispersion.

Figure S20. TGA curve of PVDF latex nanoparticles obtained using APFO.

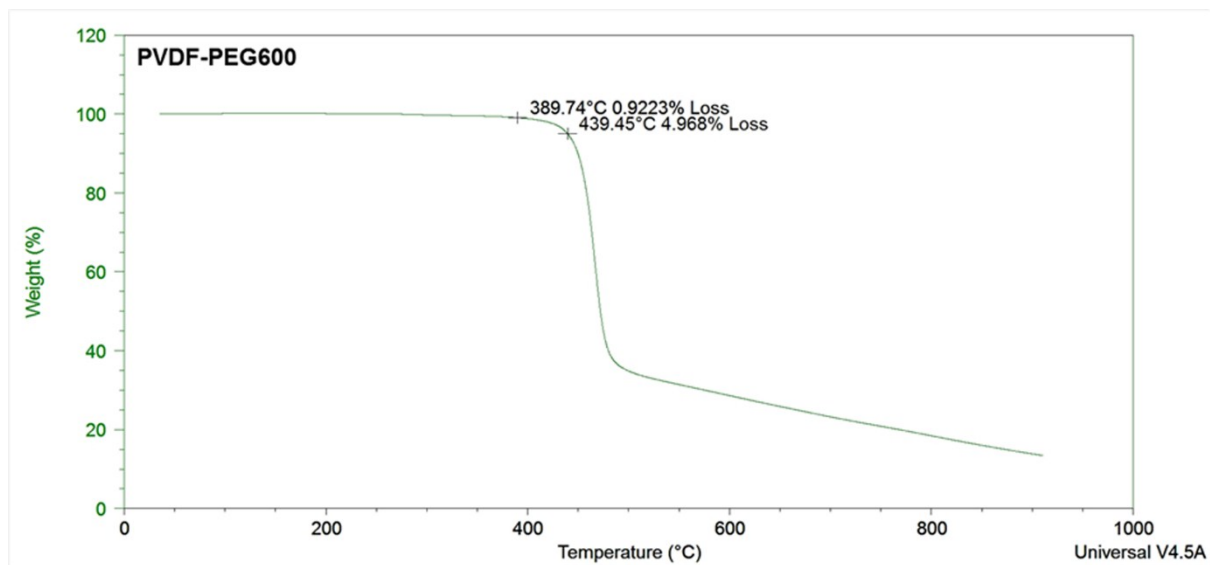Figure S21. TGA curve of PVDF latex nanoparticles obtained using PEG300.

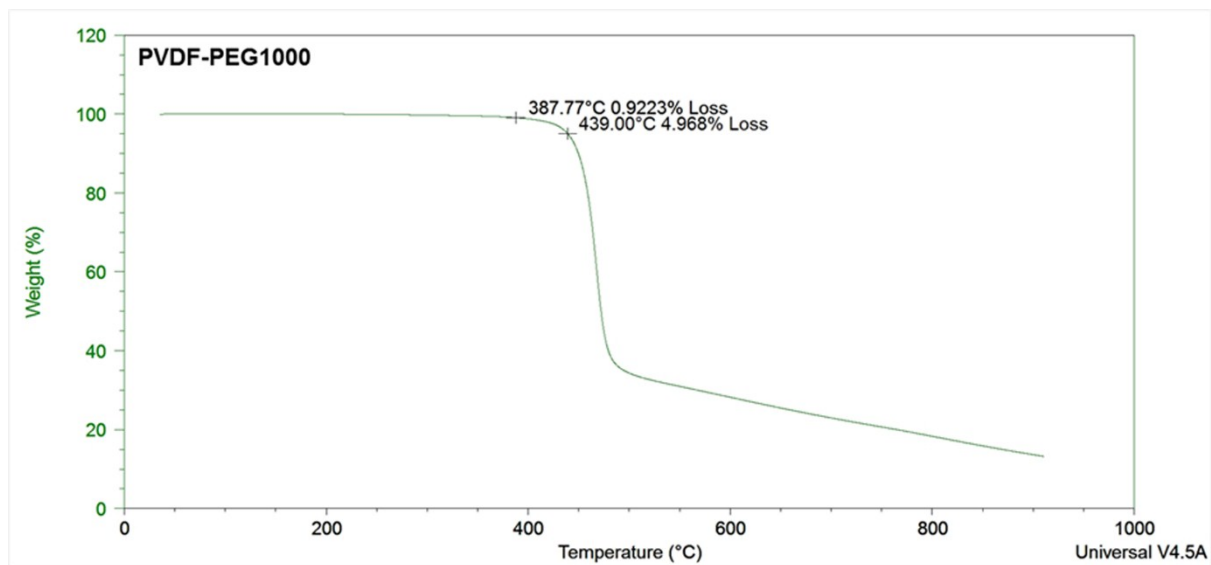Figure S22. TGA curve of PVDF latex nanoparticles obtained using PEG600.

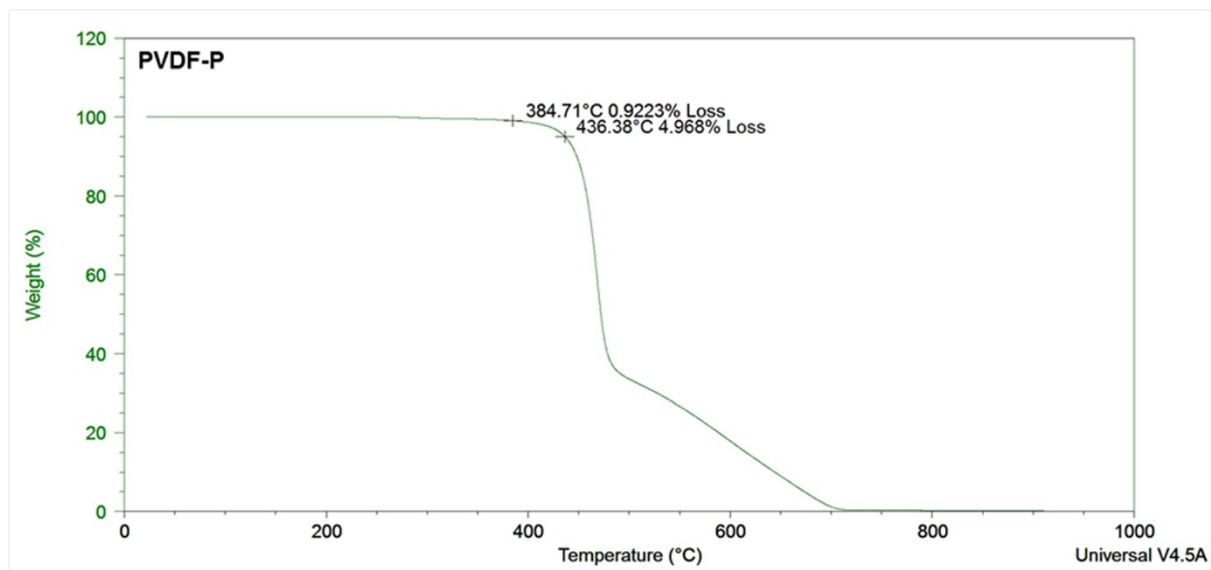Figure S23. TGA curve of PVDF latex nanoparticles obtained using PEG1000.

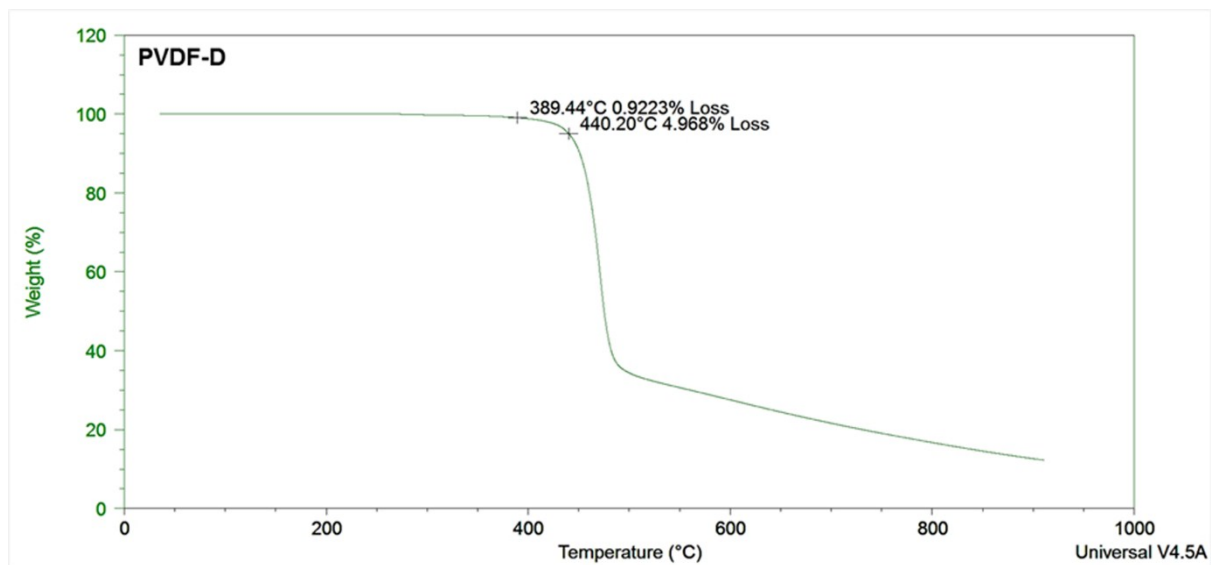Figure S24. TGA curve of PVDF latex nanoparticles obtained using PVDF nanoparticles.

Figure S25. TGA curve of PVDF latex nanoparticles obtained using diluted PVDF dispersion.