Fwd: Freezing and coating

Please see email from Dr Smith which proves to him that our Nanobubble count is real and does not include other particles.

Begin forwarded message:

From: Steve Ward-Smith
Subject: Freezing and coating
Date: 16 March 2018 at 14:42:00 GMT

Dear Tony,
We froze then defrosted some of the water we generated. Counts then back to similar levels as the blank, so killed all the bubbles. This proves to any doubters that it is indeed bubbles not any other particulate contamination.

Have you any ideas on easy ways to generate coated bubbles? We have another technology for bubble measurement but have a suspicion it works best when bubbles are coated.
Was thinking generation in soapy water, but would that form a foam? Or a protein solution?
All ideas welcome..

Regards,
Steve

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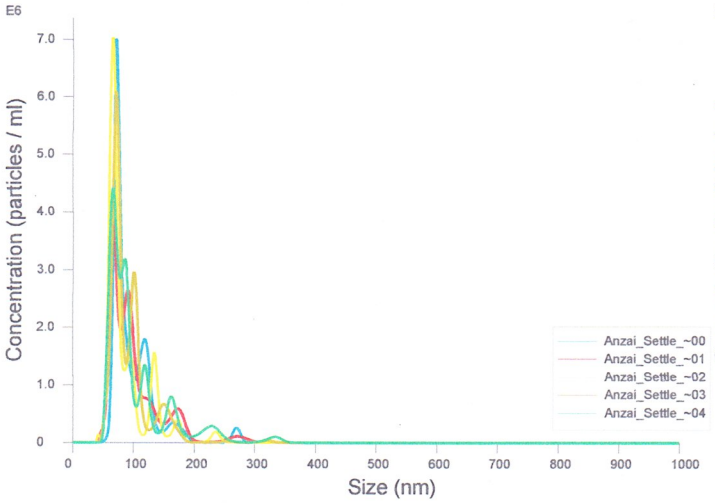
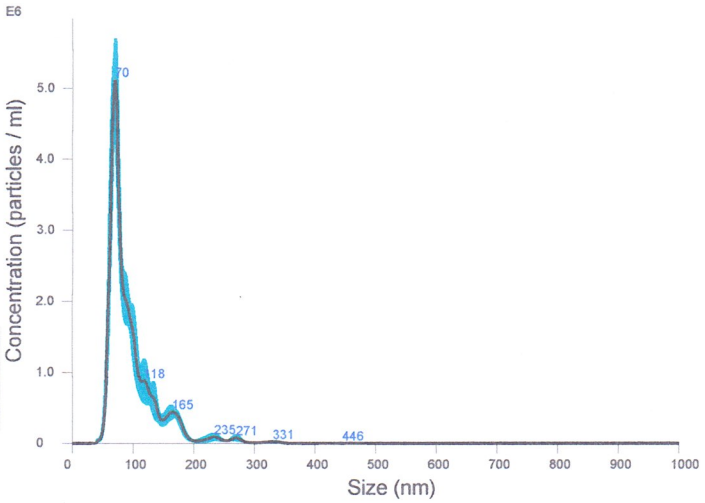
NANOSIGHT

Anzai_Settle_time



FTLA Concentration / Size graph for Experiment:
Anzai_Settle_time_



Averaged FTLA Concentration / Size for Experiment:
Anzai_Settle_time_
Error bars indicate + / -1 standard error of the mean

Included Files

Anzai_Settle_time_00
Anzai_Settle_time_01
Anzai_Settle_time_02
Anzai_Settle_time_03
Anzai_Settle_time_04

Details

NTA Version:	NTA 3.2 Dev Build 3.2.16
Script Used:	SOP Standard Measurement 12-36-44PM 09~
Time Captured:	13:03:23 09/03/2018
Operator:	
Pre-treatment:	
Sample Name:	
Diluent:	
Remarks:	

Capture Settings

Camera Type:	sCMOS
Laser Type:	Blue405
Camera Level:	Manual settings used
Slider Shutter:	1300
Slider Gain:	512
FPS	25.0
Number of Frames:	2248
Temperature:	23.5 - 23.7 °C
Viscosity:	(Water) 0.915 - 0.919 cP
Dilution factor:	Dilution not recorded
Syringe Pump Speed:	80

Analysis Settings

Detect Threshold:	6
Blur Size:	Auto
Max Jump Distance:	Auto: 14.3 - 16.0 pix

Results

Stats: Merged Data

Mean:	96.3 nm
Mode:	69.5 nm
SD:	42.3 nm
D10:	61.9 nm
D50:	80.4 nm
D90:	151.4 nm

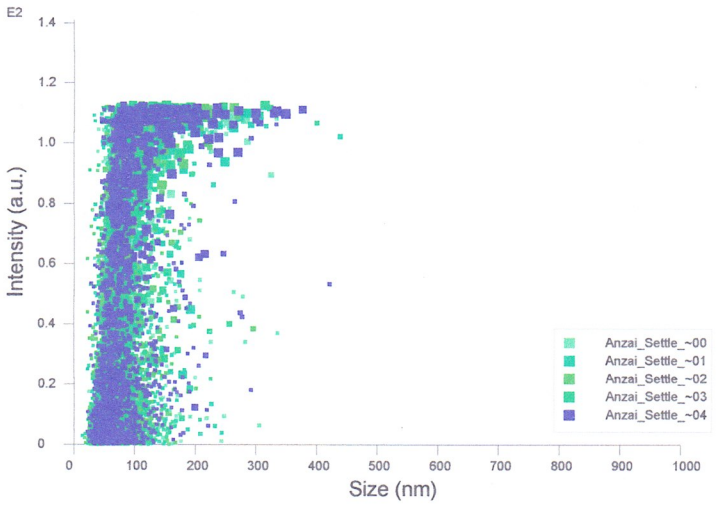
Stats: Mean +/- Standard Error

Mean:	96.2 +/- 2.8 nm
Mode:	68.4 +/- 1.4 nm
SD:	41.1 +/- 3.5 nm
D10:	62.5 +/- 1.4 nm
D50:	80.4 +/- 2.6 nm
D90:	149.4 +/- 7.2 nm
Concentration (Upgrade):	1.87e+008 +/- 3.76e+006 particles/ml
	22.6 +/- 0.6 particles/frame
	28.2 +/- 1.1 centres/frame

Concentration measurements may require some caution due to noise
See summary file for more info

NANOSIGHT

Anzai_Settle_time



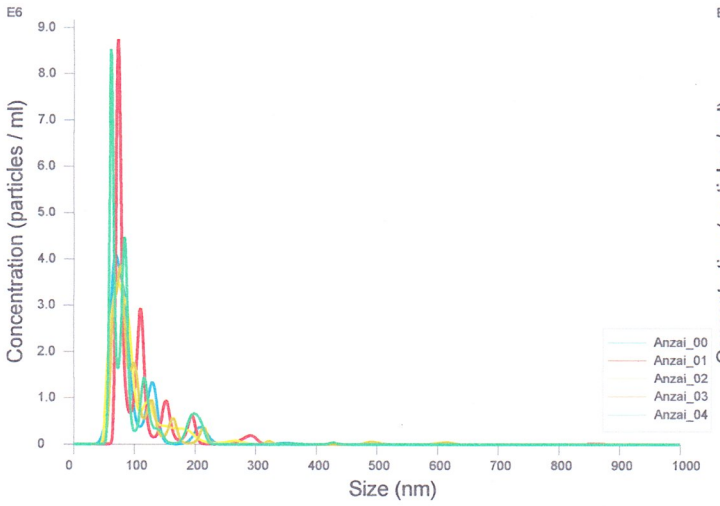
Intensity / Size graph for Experiment:
Anzai_Settle_time_

Script Used: (Full Text):

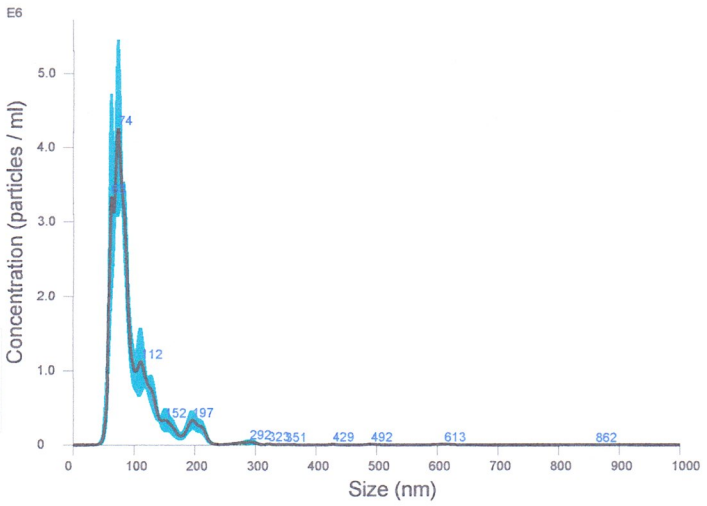
SOP Standard Measurement 12-36-44PM 09Mar2018.txt

NANOSIGHT

Anzai_



FTLA Concentration / Size graph for Experiment:
Anzai_



Averaged FTLA Concentration / Size for Experiment:
Anzai_
Error bars indicate + / -1 standard error of the mean

Included Files

Anzai_00
Anzai_01
Anzai_02
Anzai_03
Anzai_04

Details

NTA Version:	NTA 3.2 Dev Build 3.2.16
Script Used:	SOP Standard Measurement 12-36-44PM 09~
Time Captured:	12:36:54 09/03/2018
Operator:	
Pre-treatment:	
Sample Name:	
Diluent:	
Remarks:	

Capture Settings

Camera Type:	sCMOS
Laser Type:	Blue405
Camera Level:	Manual settings used
Slider Shutter:	1300
Slider Gain:	512
FPS	25.0
Number of Frames:	2248
Temperature:	22.7 - 23.2 °C
Viscosity:	(Water) 0.926 - 0.938 cP
Dilution factor:	Dilution not recorded
Syringe Pump Speed:	80

Analysis Settings

Detect Threshold:	6
Blur Size:	Auto
Max Jump Distance:	Auto: 12.8 - 16.0 pix

Results

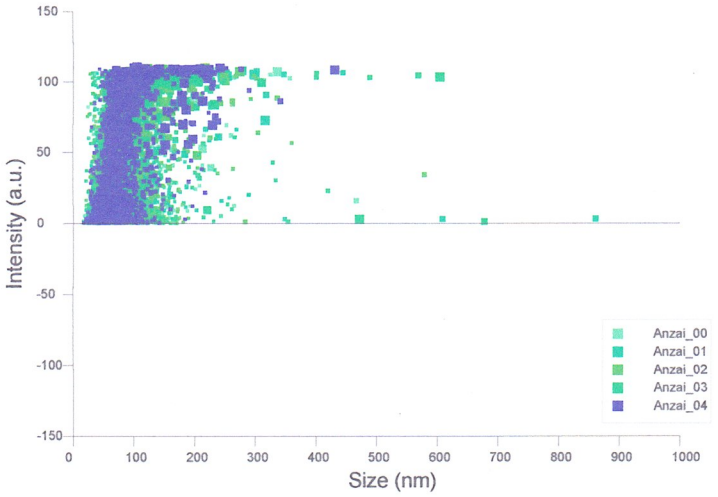
Stats: Merged Data

Mean:	99.1 nm
Mode:	73.4 nm
SD:	51.8 nm
D10:	61.6 nm
D50:	81.4 nm
D90:	154.1 nm

Stats: Mean +/- Standard Error

Mean:	99.2 +/- 2.6 nm
Mode:	70.7 +/- 2.6 nm
SD:	51.0 +/- 4.8 nm
D10:	62.8 +/- 1.9 nm
D50:	81.8 +/- 0.9 nm
D90:	157.6 +/- 7.6 nm
Concentration (Upgrade):	1.80e+008 +/- 4.51e+006 particles/ml
	21.9 +/- 0.5 particles/frame
	27.8 +/- 0.4 centres/frame

Concentration measurements may require some caution due to noise
See summary file for more info



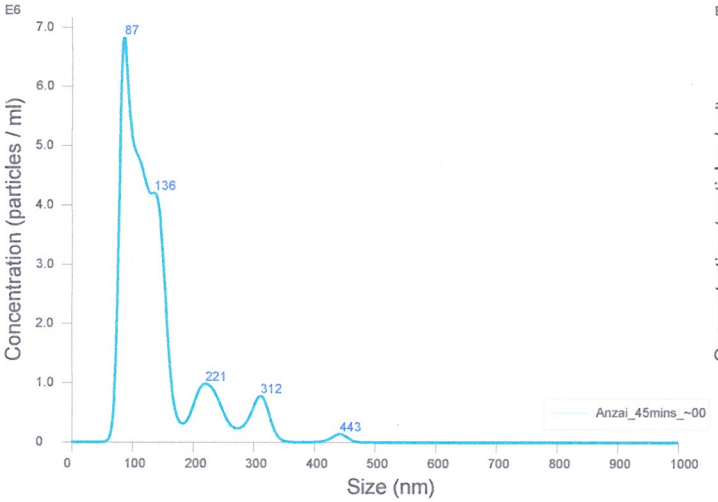
Intensity / Size graph for Experiment:
Anzai_

Script Used: (Full Text):

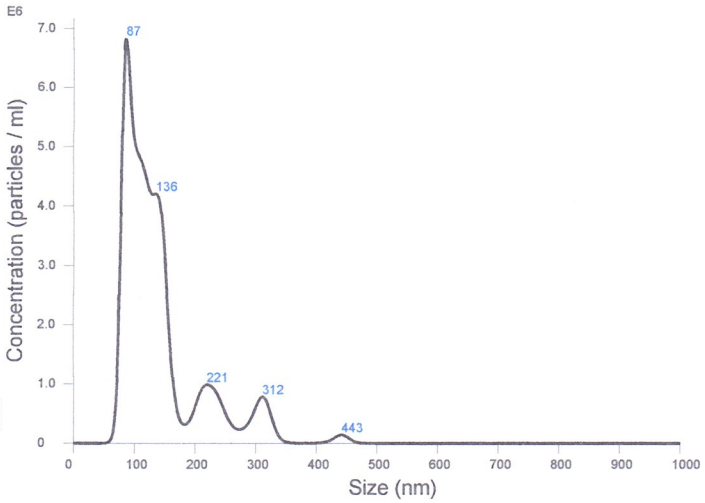
SOP Standard Measurement 12-36-44PM 09Mar2018.txt

NANOSIGHT

Anzai_45mins



FTLA Concentration / Size graph for Experiment:
Anzai_45mins_



Averaged FTLA Concentration / Size for Experiment:
Anzai_45mins_
Error bars indicate + / -1 standard error of the mean

Included Files

Anzai_45mins_00

Details

NTA Version:	NTA 3.2 Dev Build 3.2.16
Script Used:	SOP Standard Measurement 02-14-44PM 09~
Time Captured:	14:15:31 09/03/2018
Operator:	
Pre-treatment:	
Sample Name:	
Diluent:	
Remarks:	

Capture Settings

Camera Type:	sCMOS
Laser Type:	Blue405
Camera Level:	14
Slider Shutter:	1259
Slider Gain:	366
FPS	25.0
Number of Frames:	1498
Temperature:	23.1 °C
Viscosity:	(Water) 0.9 cP
Dilution factor:	Dilution not recorded
Syringe Pump Speed:	80

Analysis Settings

Detect Threshold:	6
Blur Size:	Auto
Max Jump Distance:	Auto: 12.7 pix

Results

Stats: Merged Data

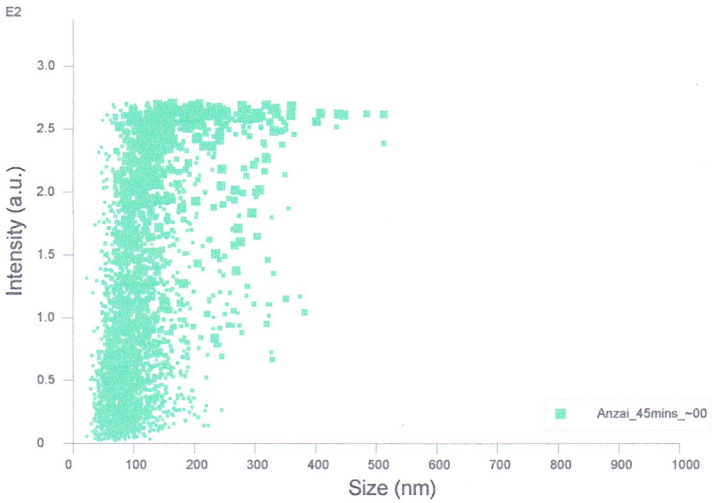
Mean:	141.3 nm
Mode:	86.2 nm
SD:	68.0 nm
D10:	82.4 nm
D50:	119.6 nm
D90:	239.3 nm

Stats: Mean +/- Standard Error

Mean:	141.3 +/- 0.0 nm
Mode:	86.2 +/- 0.0 nm
SD:	68.0 +/- 0.0 nm
D10:	82.4 +/- 0.0 nm
D50:	119.6 +/- 0.0 nm
D90:	239.3 +/- 0.0 nm
Concentration (Upgrade):	4.99e+008 +/- 0.00e+000 particles/ml
	60.7 +/- 0.0 particles/frame
	63.7 +/- 0.0 centres/frame

NANOSIGHT

Anzai_45mins



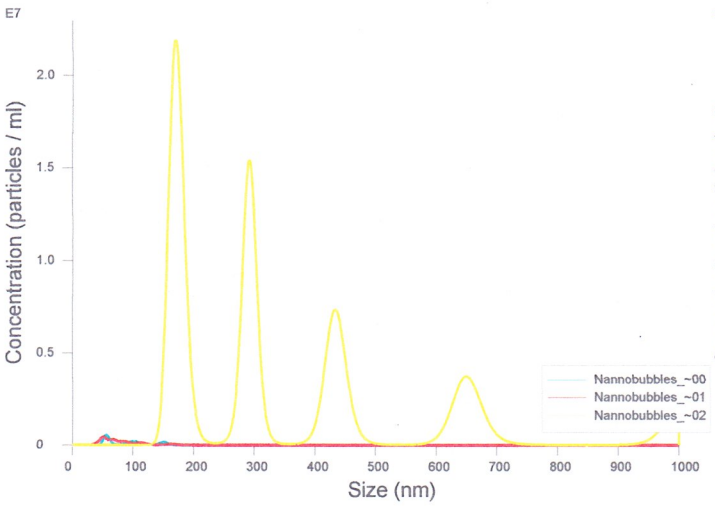
Intensity / Size graph for Experiment:
Anzai_45mins_

Script Used: (Full Text):

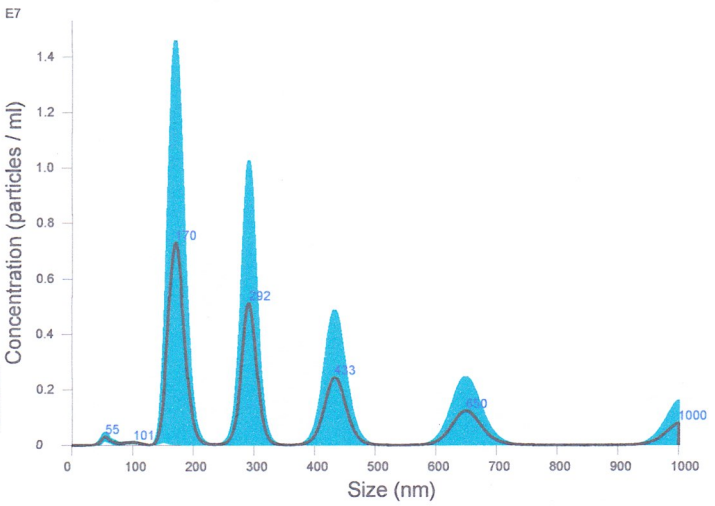
SOP Standard Measurement 02-14-44PM 09Mar2018.txt

NANOSIGHT

Nannobubbles



FTLA Concentration / Size graph for Experiment:
Nannobubbles_



Averaged FTLA Concentration / Size for Experiment:
Nannobubbles_
Error bars indicate + / -1 standard error of the mean

Included Files

Nannobubbles_00
Nannobubbles_01
Nannobubbles_02

Details

NTA Version:	NTA 3.2 Dev Build 3.2.16
Script Used:	SOP Standard Measurement 12-09-11PM 09~
Time Captured:	12:09:17 09/03/2018
Operator:	
Pre-treatment:	
Sample Name:	
Diluent:	
Remarks:	

Capture Settings

Camera Type:	sCMOS
Laser Type:	Blue405
Camera Level:	16
Slider Shutter:	1300
Slider Gain:	512
FPS	25.0
Number of Frames:	2248
Temperature:	23.0 - 23.1 °C
Viscosity:	(Water) 0.928 - 0.930 cP
Dilution factor:	Dilution not recorded
Syringe Pump Speed:	100

Analysis Settings

Detect Threshold:	5
Blur Size:	Auto
Max Jump Distance:	Auto: 7.1 - 31.6 pix

Results

Stats: Merged Data

Mean:	337.6 nm
Mode:	169.9 nm
SD:	204.4 nm
D10:	160.4 nm
D50:	286.9 nm
D90:	649.4 nm

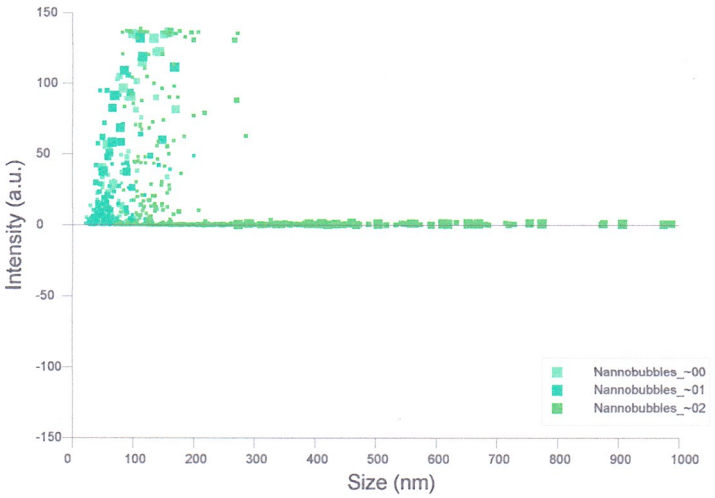
Stats: Mean +/- Standard Error

Mean:	169.7 +/- 86.5 nm
Mode:	92.3 +/- 38.9 nm
SD:	90.2 +/- 56.5 nm
D10:	86.3 +/- 38.0 nm
D50:	147.0 +/- 70.7 nm
D90:	305.3 +/- 172.8 nm
Concentration (Upgrade):	6.12e+008 +/- 5.94e+008 particles/ml
	17.6 +/- 15.7 particles/frame
	28.9 +/- 26.7 centres/frame

Concentration measurements may be unreliable
See summary file for more info

NANOSIGHT

Nannobubbles



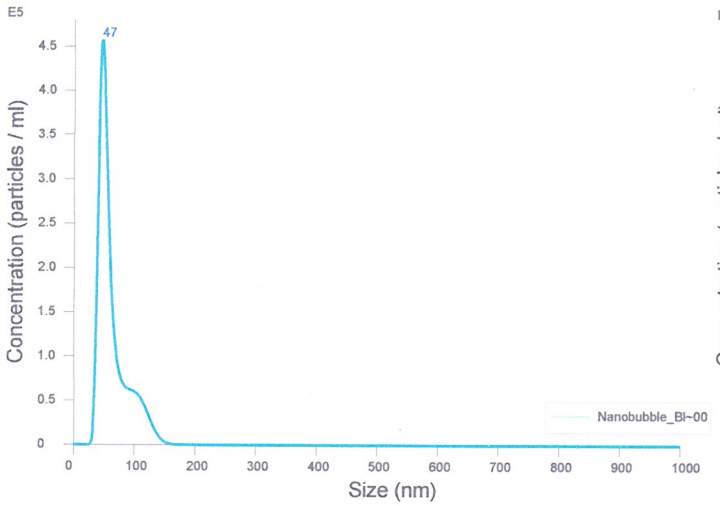
Intensity / Size graph for Experiment:
Nannobubbles_

Script Used: (Full Text):

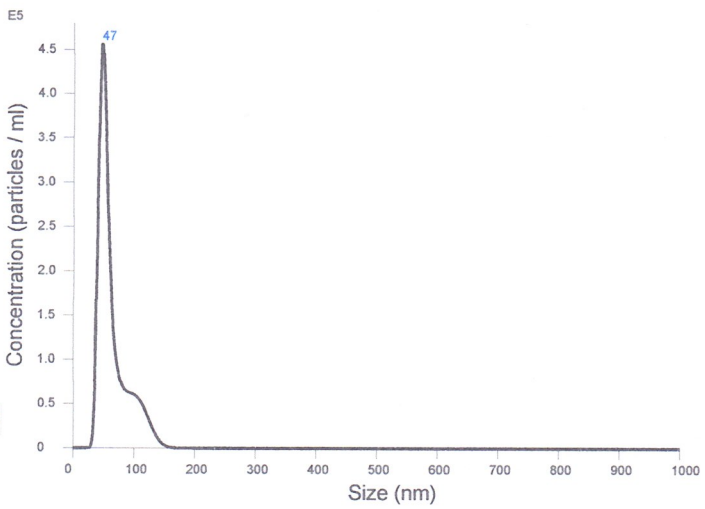
SOP Standard Measurement 12-09-11PM 09Mar2018.txt

NANOSIGHT

Nanobubble_Blank



FTLA Concentration / Size graph for Experiment:
Nanobubble_Blank_



Averaged FTLA Concentration / Size for Experiment:
Nanobubble_Blank_
Error bars indicate + / -1 standard error of the mean

Included Files

Nanobubble_Blank_00

Details

NTA Version:	NTA 3.2 Dev Build 3.2.16
Script Used:	SOP Standard Measurement 11-40-23AM 09~
Time Captured:	11:40:29 09/03/2018
Operator:	
Pre-treatment:	
Sample Name:	
Diluent:	
Remarks:	

Capture Settings

Camera Type:	sCMOS
Laser Type:	Blue405
Camera Level:	16
Slider Shutter:	1300
Slider Gain:	512
FPS	25.0
Number of Frames:	1498
Temperature:	21.2 °C
Viscosity:	(Water) 1.0 cP
Dilution factor:	Dilution not recorded
Syringe Pump Speed:	100

Analysis Settings

Detect Threshold:	5
Blur Size:	Auto
Max Jump Distance:	Auto: 14.4 pix

Results

Stats: Merged Data

Mean:	63.5 nm
Mode:	46.7 nm
SD:	24.8 nm
D10:	40.1 nm
D50:	53.2 nm
D90:	103.4 nm

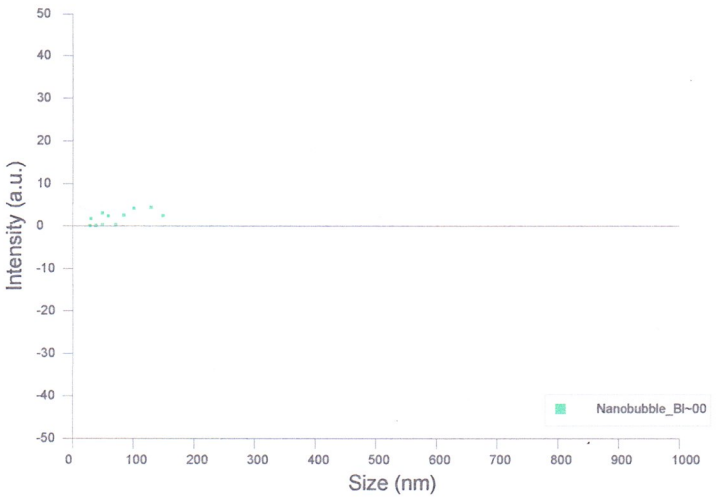
Stats: Mean +/- Standard Error

Mean:	63.5 +/- 0.0 nm
Mode:	46.7 +/- 0.0 nm
SD:	24.8 +/- 0.0 nm
D10:	40.1 +/- 0.0 nm
D50:	53.2 +/- 0.0 nm
D90:	103.4 +/- 0.0 nm
Concentration (Upgrade):	1.35e+007 +/- 0.00e+000 particles/ml
	0.6 +/- 0.0 particles/frame
	1.4 +/- 0.0 centres/frame

Concentration measurements may be unreliable
See summary file for more info

NANOSIGHT

Nanobubble_Blank



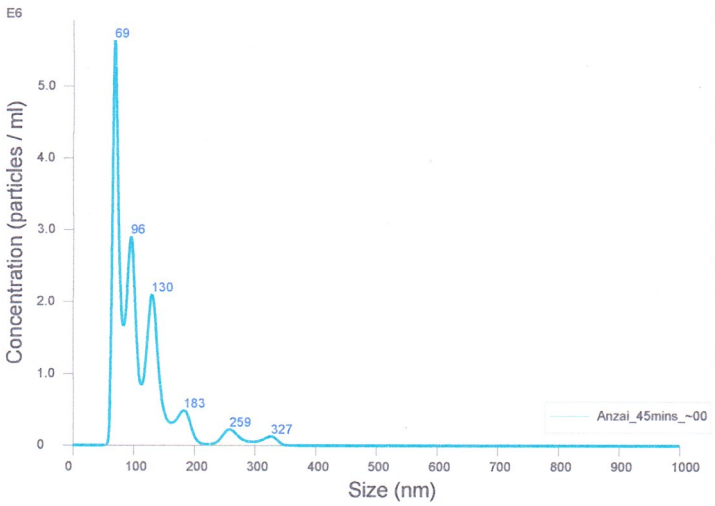
Intensity / Size graph for Experiment:
Nanobubble_Blank_

Script Used: (Full Text):

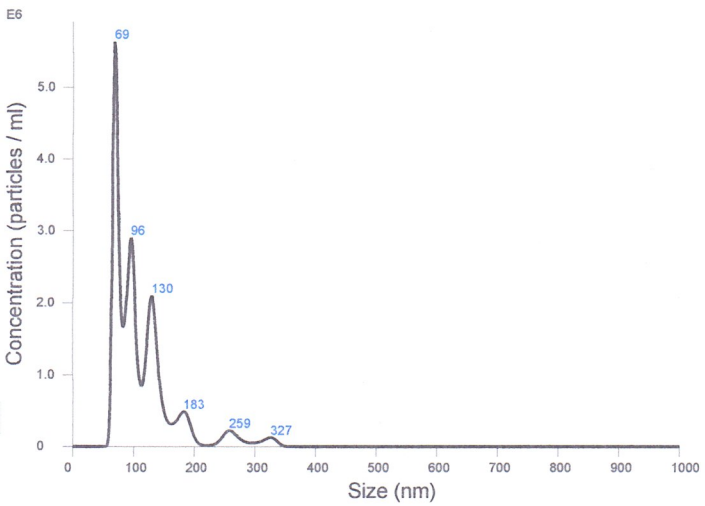
SOP Standard Measurement 11-40-23AM 09Mar2018.txt

NANOSIGHT

Anzai_45mins_10x



FTLA Concentration / Size graph for Experiment:
Anzai_45mins_10x_



Averaged FTLA Concentration / Size for Experiment:
Anzai_45mins_10x_
Error bars indicate + / -1 standard error of the mean

Included Files

Anzai_45mins_10x_00

Details

NTA Version:	NTA 3.2 Dev Build 3.2.16
Script Used:	SOP Standard Measurement 02-14-44PM 09~
Time Captured:	14:27:36 09/03/2018
Operator:	
Pre-treatment:	
Sample Name:	
Diluent:	
Remarks:	

Capture Settings

Camera Type:	sCMOS
Laser Type:	Blue405
Camera Level:	16
Slider Shutter:	1300
Slider Gain:	512
FPS	25.0
Number of Frames:	1498
Temperature:	23.2 °C
Viscosity:	(Water) 0.9 cP
Dilution factor:	Dilution not recorded
Syringe Pump Speed:	80

Analysis Settings

Detect Threshold:	6
Blur Size:	Auto
Max Jump Distance:	Auto: 14.3 pix

Results

Stats: Merged Data

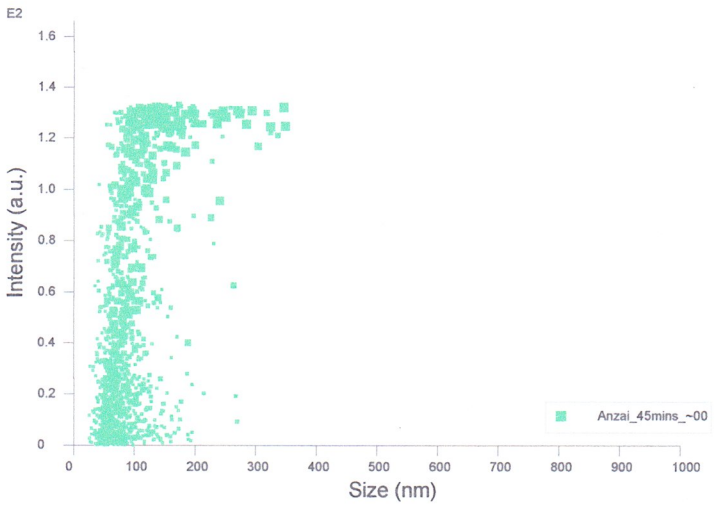
Mean:	113.3 nm
Mode:	68.7 nm
SD:	53.4 nm
D10:	66.6 nm
D50:	96.2 nm
D90:	176.7 nm

Stats: Mean +/- Standard Error

Mean:	113.3 +/- 0.0 nm
Mode:	68.7 +/- 0.0 nm
SD:	53.4 +/- 0.0 nm
D10:	66.6 +/- 0.0 nm
D50:	96.2 +/- 0.0 nm
D90:	176.7 +/- 0.0 nm
Concentration (Upgrade):	2.11e+008 +/- 0.00e+000 particles/ml
	26.0 +/- 0.0 particles/frame
	30.9 +/- 0.0 centres/frame

NANOSIGHT

Anzai_45mins_10x



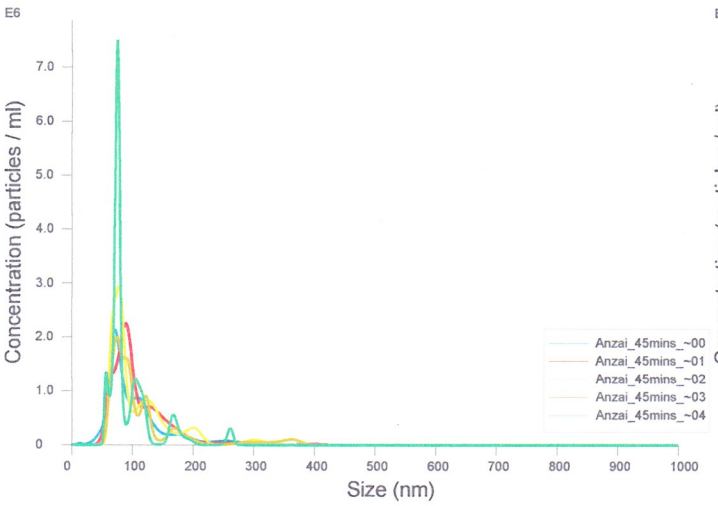
Intensity / Size graph for Experiment:
Anzai_45mins_10x_

Script Used: (Full Text):

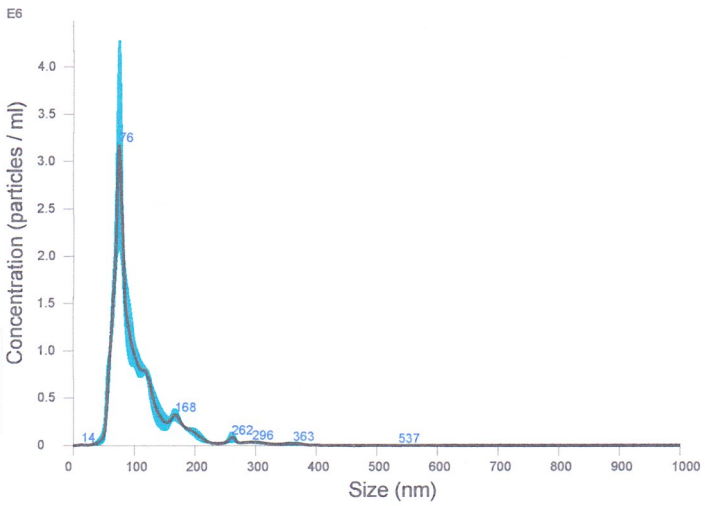
SOP Standard Measurement 02-14-44PM 09Mar2018.txt

NANOSIGHT

Anzai_45mins_10x_5_repeats



FTLA Concentration / Size graph for Experiment:
Anzai_45mins_10x_5_repeats_



Averaged FTLA Concentration / Size for Experiment:
Anzai_45mins_10x_5_repeats_
Error bars indicate + / -1 standard error of the mean

Included Files

Anzai_45mins_10x_5_repeats_00
Anzai_45mins_10x_5_repeats_01
Anzai_45mins_10x_5_repeats_02
Anzai_45mins_10x_5_repeats_03
Anzai_45mins_10x_5_repeats_04

Details

NTA Version:	NTA 3.2 Dev Build 3.2.16
Script Used:	SOP Standard Measurement 02-32-49PM 09~
Time Captured:	14:32:59 09/03/2018
Operator:	
Pre-treatment:	
Sample Name:	
Diluent:	
Remarks:	

Capture Settings

Camera Type:	sCMOS
Laser Type:	Blue405
Camera Level:	16
Slider Shutter:	1300
Slider Gain:	512
FPS	25.0
Number of Frames:	2248
Temperature:	23.5 - 23.7 °C
Viscosity:	(Water) 0.916 - 0.920 cP
Dilution factor:	Dilution not recorded
Syringe Pump Speed:	80

Analysis Settings

Detect Threshold:	6
Blur Size:	Auto
Max Jump Distance:	Auto: 14.3 - 27.6 pix

Results

Stats: Merged Data

Mean:	106.0 nm
Mode:	75.4 nm
SD:	51.8 nm
D10:	64.5 nm
D50:	86.9 nm
D90:	169.4 nm

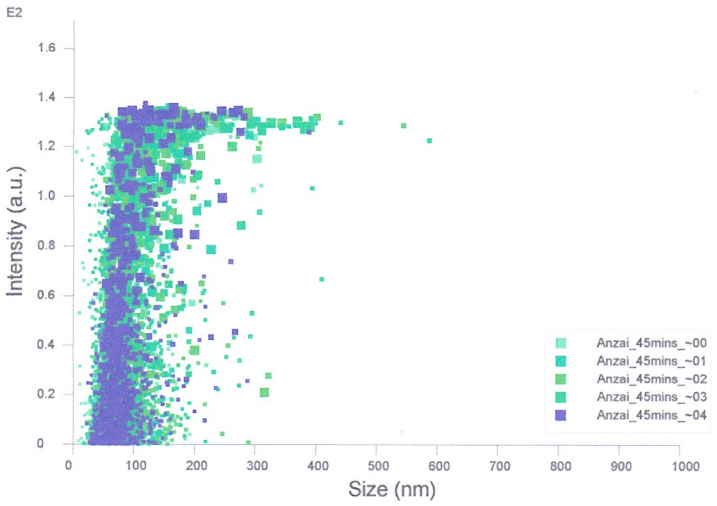
Stats: Mean +/- Standard Error

Mean:	106.3 +/- 3.4 nm
Mode:	77.5 +/- 3.1 nm
SD:	51.2 +/- 4.4 nm
D10:	64.4 +/- 1.1 nm
D50:	87.0 +/- 2.9 nm
D90:	172.0 +/- 4.8 nm
Concentration (Upgrade):	1.25e+008 +/- 6.44e+006 particles/ml
	15.0 +/- 0.6 particles/frame
	18.4 +/- 0.2 centres/frame

Concentration measurements may require some caution due to noise
See summary file for more info

NANOSIGHT

Anzai 45mins 10x 5 repeats



Intensity / Size graph for Experiment:
Anzai_45mins_10x_5_repeats_

Script Used: (Full Text):

SOP Standard Measurement 02-32-49PM 09Mar2018.txt