

BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

1. Variasi konsentrasi surfaktan menghasilkan transfersom dengan perbedaan ukuran partikel dan zeta potensial keempat formula.
2. Karakterisasi fisetin transfersom menghasilkan ukuran berturut-turut sebesar 611,8; 642,2; 986,166; 957,066 nm. Zeta potensial fisetin transfersom sebesar -16,4333; -4,1733; -8,233; -4,0933mV. Fisetin transfersom stabil dalam proses penyimpanan pada suhu kamar.
3. Karakterisasi serum transfersom fisetin dengan uji pH serum menunjukkan pH 6,32, uji viskositas serum fisetin 1200 cPs dan serum stabil dalam penyimpanan suhu kamar sehingga sediaan serum menghasilkan uji mutu fisik yang baik.

B. Saran

1. Perlu dilakukan variasi kombinasi sodium glukonat untuk mengetahui jumlah penstabil terbaik serum fisetin.
2. Perlu dilakukan uji difusi Franz pada serum fisetin transfersom untuk mengetahui jumlah fisetin yang terpenetrasi melalui kulit selama interval waktu tertentu.

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Lampiran 1. *Certificate of analysis (COA) fisetin*

TOCRIS
a biotechne brand

Print Date: Jan 14th 2016

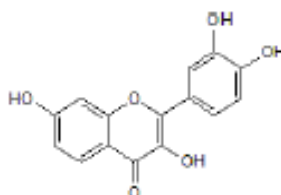
Certificate of Analysis

www.tocris.com

Product Name: Fisetin	Catalog No.: 5016	Batch No.: 1
CAS Number: 528-48-3		
IUPAC Name: 2-(3,4-Dihydroxyphenyl)-3,7-dihydroxy-4H-1-benzopyran-4-one		

1. PHYSICAL AND CHEMICAL PROPERTIES

Batch Molecular Formula:	C ₁₅ H ₁₀ O ₈
Batch Molecular Weight:	286.24
Physical Appearance:	Yellow solid
Solubility:	DMSO to 100 mM ethanol to 10 mM
Storage:	Store at -20°C
Batch Molecular Structure:	



2. ANALYTICAL DATA

HPLC:	Shows 98.1% purity
¹H NMR:	Consistent with structure
Mass Spectrum:	Consistent with structure
Microanalysis:	
	Carbon Hydrogen Nitrogen
Theoretical	62.94 3.52
Found	62.81 3.58

Caution - Not Fully Tested • Research Use Only • Not For Human or Veterinary Use

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techsupport@bio-techne.com

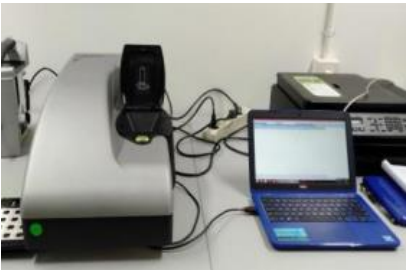
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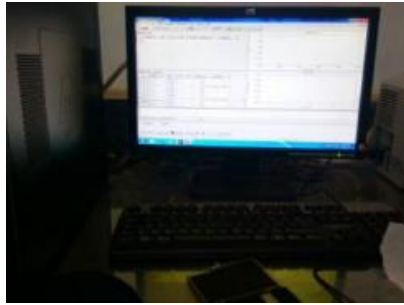
Lampiran 2. Alat-yang digunakan

Nama Alat	Gambar alat	Fungsi
Neraca Analitik		Untuk menimbang bahan
Rotary evaporator		Untuk menguapkan pelarut Organic
<i>Particle Size Analyzer (PSA)</i>		Alat yang digunakan untuk mengukur ukuran partikel
Zeta Nanosizer ZS		Analisa ukuran zeta potensial menggunakan hamburan cahaya elektroforesis

*Spektrofotometri
Uv-vis*



Merupakan spektrofotometer yang digunakan untuk pengukuran serapan cahaya di daerah ultraviolet (200 – 350 nm) dan sinar tampak (350 – 800 nm) oleh suatu senyawa.



Magnetic stirrer



berfungsi menghomogenkan suatu larutan dengan pengadukan.

pH Meter



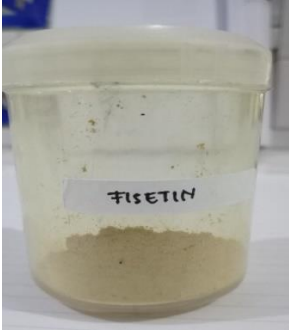
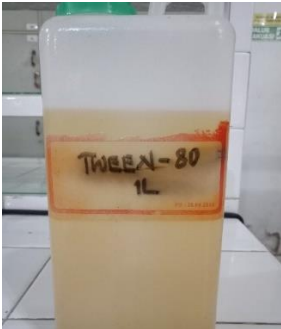
Untuk mengukur pH buffer

Sonicator

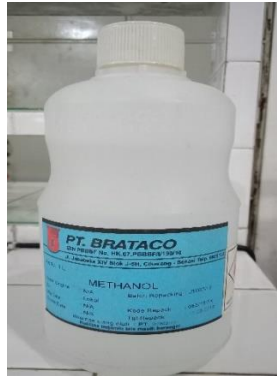


Berfungsi memecah partikel dengan energi suara.

Lampiran 3. Bahan yang digunakan

Nama Bahan	Gambar Bahan	Fungsi
Fisetin		Zat aktif
Fosfatidilkolin		Fosfolipid
Tween-80		Surfaktan
Kloroform		Pelarut

Methanol



Pelarut

Buffer fosfat pH
7,4Pelarut untuk kurva
kalibrasi dan untuk
pembentukan vesikel

Aquadest

Untuk melarutkan
 KH_2PO_4 dan NaOH
dalam pembuatan
buffer fosfat.

Ethanol PA

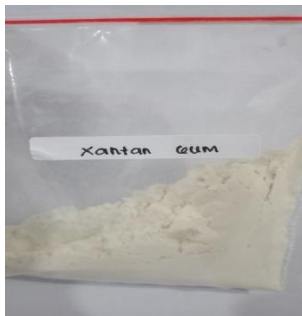
Melarutkan fisetin
untuk kurva kalibrasi.

Distilled water



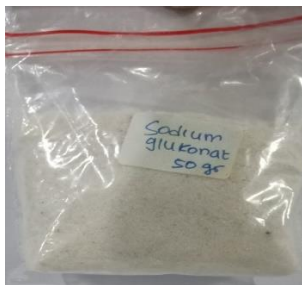
Pelarut serum

Xantan Gum



Pelembut Serum

Sodium
Glukonat



Penstabil Serum

Optiphen



Antimikroba Serum

Hyaluronic Acid



Humektan

Propilen Glikol



Humektan

Lampiran 4. Formula Fisetin Transfersom



Ket : Formula 1 menggunakan perbandingan fosfatidilkolin : Tween 80 (90:10)
Formula 2 menggunakan perbandingan fosfatidilkolin : Tween 80 (85:15)
Formula 3 menggunakan perbandingan fosfatidilkolin : Tween 80 (80:20)
Formula 4 menggunakan perbandingan fosfatidilkolin : Tween 80 (75:25)

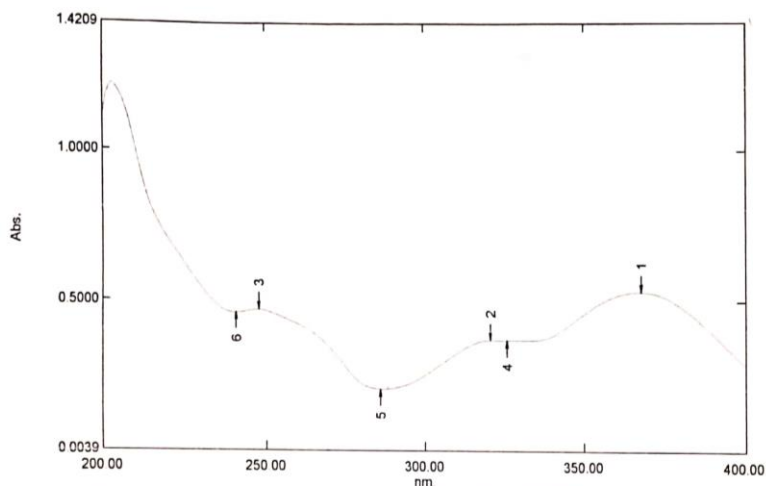
Lampiran 5. Data Verifikasi Spektrofotometer UV-Vis

2.1. PENENTUAN PANJANG GELOMBANG

Spectrum Peak Pick Report

02/24/2020 01:43:21 PM

Data Set: File_200224_133943 - RawData



[Measurement Properties]

Wavelength Range (nm.) 200.00 to 400.00
 Scan Speed Medium
 Sampling Interval 1.0
 Auto Sampling Interval Disabled
 Scan Mode Single

[Instrument Properties]

Instrument Type UV-1800 Series
 Measuring Mode Absorbance
 Slit Width 1.0 nm
 Light Source Change Wavelength 340.0 nm
 S/R Exchange Normal

[Attachment Properties]

Attachment None

[Operation]

Threshold 0.0010000
 Points 4
 Interpolate Disabled
 Average Disabled

[Sample Preparation Properties]

Weight
 Volume
 Dilution
 Path Length
 Additional Information

No.	P/V	Wavelength	Abs.	Description
1	●	368.00	0.5329	
2	●	321.00	0.3722	
3	●	248.00	0.4692	
4	●	326.00	0.3709	
5	●	286.00	0.2074	
6	●	241.00	0.4589	

Panjang gelombang maksimum yang diperoleh dari scanning larutan fisetin dalam larutan dapar fosfat pH 7,4, Panjang gelombang maksimum yang diperoleh sebesar 368 nm dengan serapan 0,5329.

2.2 PENENTUAN OPERATING TIME

DATA OT

Kinetics Data Print Report

02/24/2020 02:46:09 PM

Time (Minute)	RawData ...	Waktu (menit)
0 000	0.490	0
1 000	0.491	1
2 000	0.491	2
3 000	0.490	3
4 000	0.490	4
5 000	0.488	5
6 000	0.488	6
7 000	0.487	7
8 000	0.487	8
9 000	0.488	9
10 000	0.487	10
11 000	0.487	11
12 000	0.486	12
13 000	0.485	13
14 000	0.484	14
15 000	0.483	15
16 000	0.484	16
17 000	0.483	17
18 000	0.481	18
19 000	0.481	19
20 000	0.481	20
21 000	0.480	21
22 000	0.480	22
23 000	0.481	23
24 000	0.479	24
25 000	0.479	25
26 000	0.479	26
27 000	0.478	27
28 000	0.477	28
29 000	0.477	29
30 000	0.477	30

2.3 KURVA KALIBRASI (LINIERITAS)

Penimbangan Bahan :

Kertas Kosong = 0.1045 gram

Kertas + bahan = 0,1152 gram

Kertas + sisa = $\frac{0,1053 \text{ gram}}{0,099 \text{ gram}} -$

Lamda maks = 368 nm

OT = 18-20 menit

Larutan induk 99 ppm

Perhitungan konsentrasi kurva kalibrasi :

$$1) V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 99 \text{ ppm} = 5 \text{ ppm} \times 10 \text{ ml}$$

$$V_1 = 0,5 \text{ ml}$$

$$2) V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 99 \text{ ppm} = 8 \text{ ppm} \times 10 \text{ ml}$$

$$V_1 = 0,8 \text{ ml}$$

$$3) V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 99 \text{ ppm} = 11 \text{ ppm} \times 10 \text{ ml}$$

$$V_1 = 1,1 \text{ ml}$$

$$4) V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 99 \text{ ppm} = 14 \text{ ppm} \times 10 \text{ ml}$$

$$V_1 = 1,4 \text{ ml}$$

$$5) V_1 \times N_1 = V_2 \times N_2$$

$$V_1 \times 99 \text{ ppm} = 17 \text{ ppm} \times 10 \text{ ml}$$

$$V_1 = 1,7 \text{ ml}$$

Konsentrasi (ppm)	Absorbansi
5	0,282
8	0,398
11	0,502
14	0,641
17	0,745

Persamaan regresi linier antara konsentrasi (ppm) dan serapan diperoleh nilai :

$$a = 0,0849$$

$$b = 0,0389$$

$$r = 0,9990$$

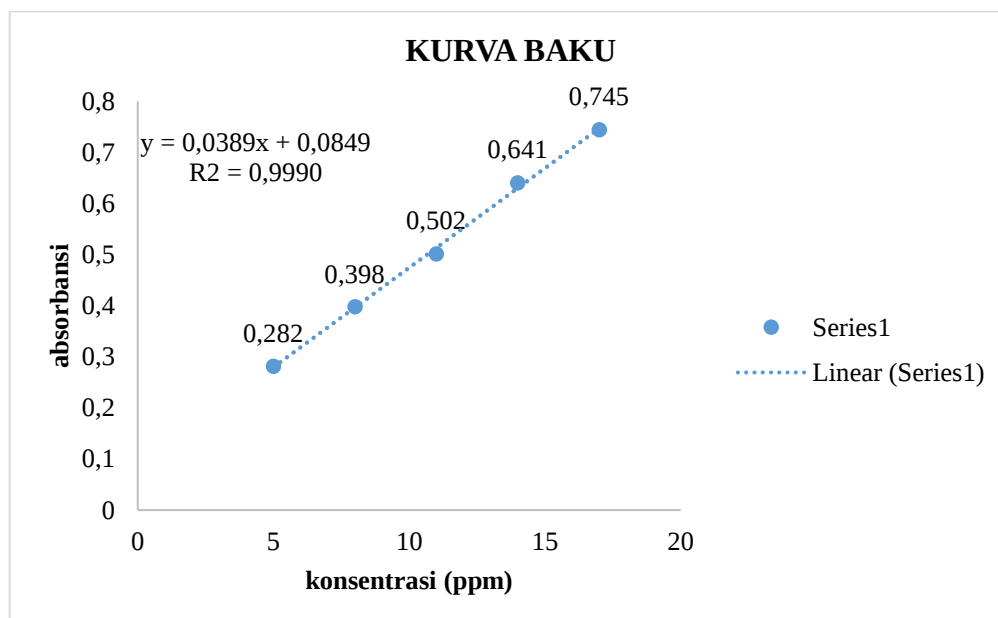
$$y = a + bx$$

$$y = 0,0849 + 0,0389x$$

keterangan :

x = konsentrasi ($\mu\text{g/ml}$)

y = serapan



2.3 AKURASI

X (ppm)	Y (abs)	Konsentrasi	Replikasi	ABS	Konsentrasi	Sebenarnya	%	% Rata-rata	
2	0,153	80%	1	0,603	8,0992	8	101%	101,52%	101,11%
4	0,3		2	0,605	8,1264	8	102%		
6	0,454		3	0,606	8,1400	8	102%		
8	0,593	100%	1	0,761	10,2504	10	103%	102,82%	
10	0,752		2	0,763	10,2777	10	103%		
12	0,88		3	0,766	10,3185	10	103%		
14	1,038	120%	1	0,89	12,0068	12	100%	99,00%	
			2	0,87	11,7345	12	98%		
			3	0,882	11,8979	12	99%		

Nilai rata-rata recovery dilihat dari data diatas adalah 101,11%

2.4 PRESISI

KONSENTRASI (ppm)	REPLIKASI	ABS	KONSENTRASI
11	1	0,528	11,3695
11	2	0,509	10,8820
11	3	0,523	11,2412
11	4	0,517	11,0873
11	5	0,495	10,5227
11	6	0,495	10,5227
11	7	0,505	10,7793
11	8	0,5	10,6510
11	9	0,499	10,6253
11	10	0,512	10,9589

SD	0,298066191
RATA-RATA	10,8640
CV	0,027436171

Nilai CV dilihat dari data di atas adalah 1%, hasil ini sesuai dengan persyaratan presisi yaitu $\leq 2\%$.

Lampiran 6. Psa dan Zeta Potensial Fisetin Transfersom

1.1 DATA PSA

FORMULA	PEMBACAAN 1 (nm)	PEMBACAAN 2 (nm)	PEMBACAAN 3 (nm)	RATA-RATA (nm)
1	647,8	622,4	565,2	611,8
2	585,8	665	675,8	642,2
3	999,5	1061	898	986,1666667
4	1018	1002	851,2	957,0666667

1.2 DATA Pdl

FORMULA	PEMBACAAN 1 (nm)	PEMBACAAN 2 (nm)	PEMBACAAN 3 (nm)	RATA-RATA (nm)
1	0,541	0,637	0,916	0,698
2	1	0,699	0,724	0,807666667
3	0,666	0,697	1	0,787666667
4	0,672	0,659	1	0,777

1.3 DATA Zeta Potensial

FORMULA	PEMBACAAN 1 (nm)	PEMBACAAN 2 (nm)	PEMBACAAN 3 (nm)	RATA-RATA (nm)
1	-15,7	-15,9	-17,7	-16,43333333
2	-3,83	-4,22	-4,47	-4,173333333
3	-8,39	-8,1	-8,21	-8,233333333
4	-4,03	-4,09	-4,16	-4,093333333

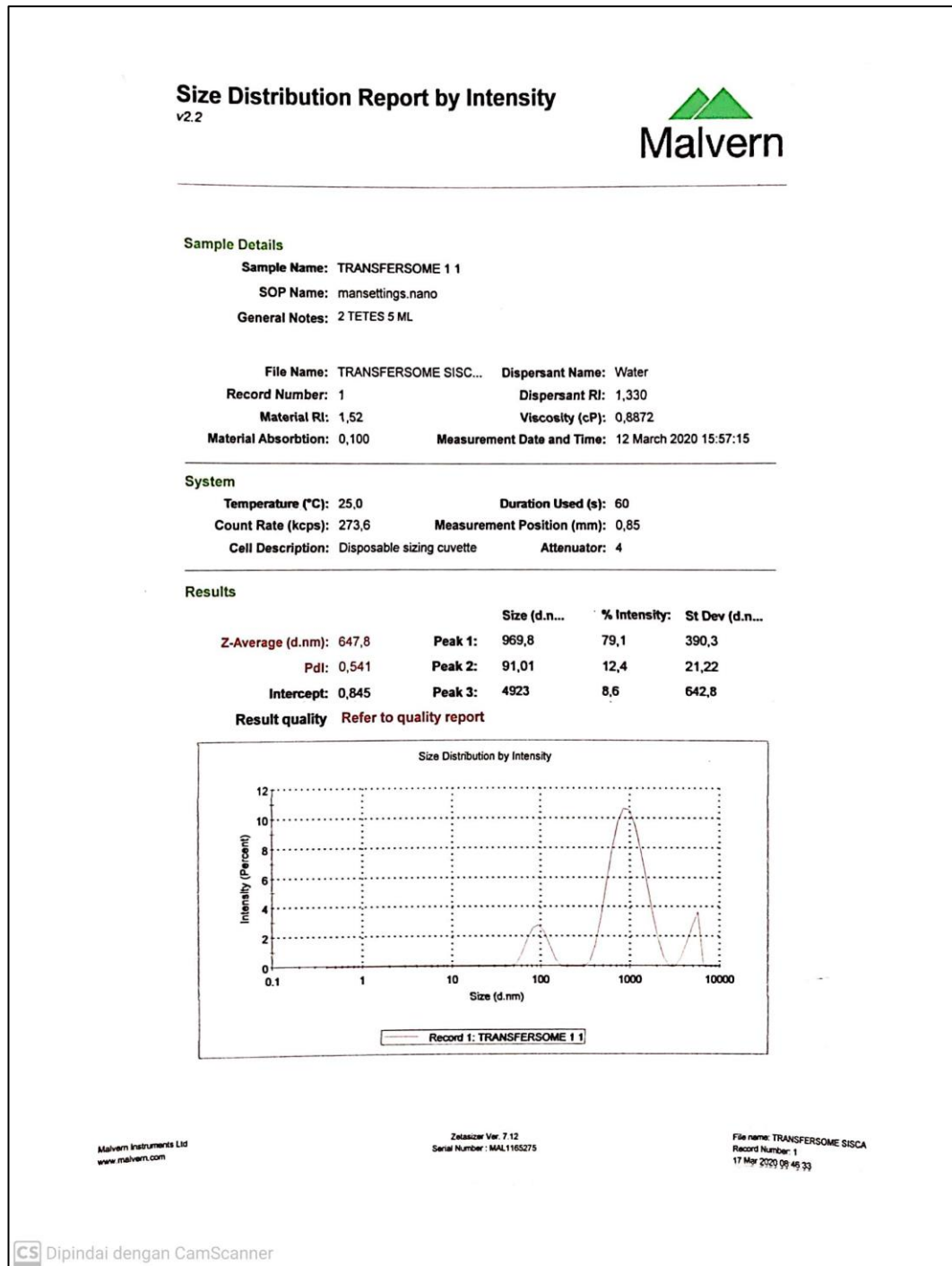
1.4 DATA Standar Deviasi

FORMULA	Replikasi	Ukuran Partikel (nm)±SD	PdI±SD	Zeta potensial±SD
FORMULA 1	1	647,8±42,30792	0,541±0,1948	-15,7±1,101514
	2	622,4±42,30792	0,637±0,1948	-15,9±1,101514
	3	565,2±42,30792	0,916±0,1948	-17,7±1,101514
FORMULA 2	1	585,8±49,14143	1±0,167034	-3,83±0,322542
	2	665±49,14143	0,699±0,167034	-4,22±0,322542
	3	675,8±49,14143	0,724±0,167034	-4,47±0,322542
FORMULA 3	1	999,5±82,31393	0,666±0,184538	-8,39±0,146401
	2	1061±82,31393	0,697±0,184538	-8,1±0,146401
	3	898±82,31393	1±0,184538	-8,21±0,146401
FORMULA 4	1	1018±92,03159	0,672±0,193233	-4,03±0,065064
	2	1002±92,03159	0,659±0,193233	-4,09±0,065064
	3	851,2±92,03159	1±0,193233	-4,16±0,065064

1.5 HASIL PSA

1.5.1 Uji Ukuran Partikel Formula 1

a. Replikasi 1



b. Replikasi 2

Size Distribution Report by Intensity
v2.2

Sample Details

Sample Name: TRANSFERSOME 1 2

SOP Name: mansettings.nano

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISC... Dispersant Name: Water
 Record Number: 2 Dispersant RI: 1,330
 Material RI: 1,52 Viscosity (cP): 0,8872
 Material Absorption: 0,100 Measurement Date and Time: 12 March 2020 15:59:29

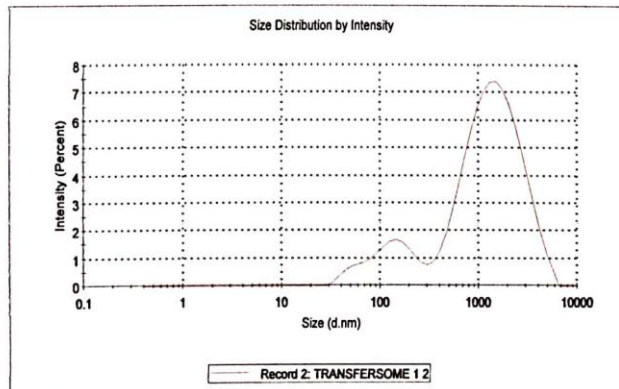
System

Temperature (°C): 25,0 Duration Used (s): 60
 Count Rate (kcps): 275,9 Measurement Position (mm): 0,85
 Cell Description: Disposable sizing cuvette Attenuator: 4

Results

	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 622,4	Peak 1: 1644	84,1	1029
Pdl: 0,637	Peak 2: 135,1	15,9	68,67
Intercept: 0,846	Peak 3: 0,000	0,0	0,000

Result quality Refer to quality report



c. Replikasi 3

Size Distribution Report by Intensity
v2.2

Sample Details

Sample Name: TRANSFERSOME 1 3

SOP Name: mansettings.nano

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISC... Dispersant Name: Water

Record Number: 3 Dispersant RI: 1,330

Material RI: 1,52 Viscosity (cP): 0,8872

Material Absorbance: 0,100 Measurement Date and Time: 12 March 2020 16:01:42

System

Temperature (°C): 25,0

Duration Used (s): 60

Count Rate (kcps): 278,8

Measurement Position (mm): 0,85

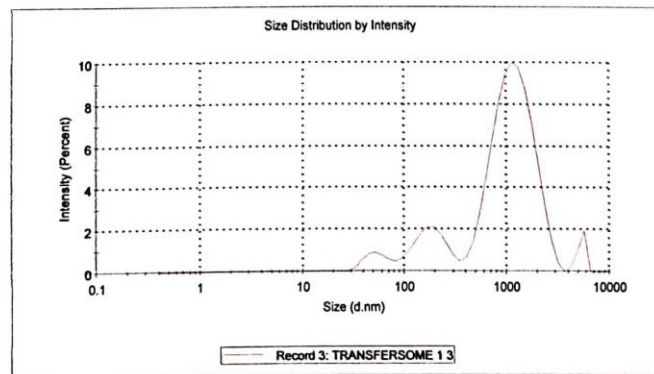
Cell Description: Disposable sizing cuvette

Attenuator: 4

Results

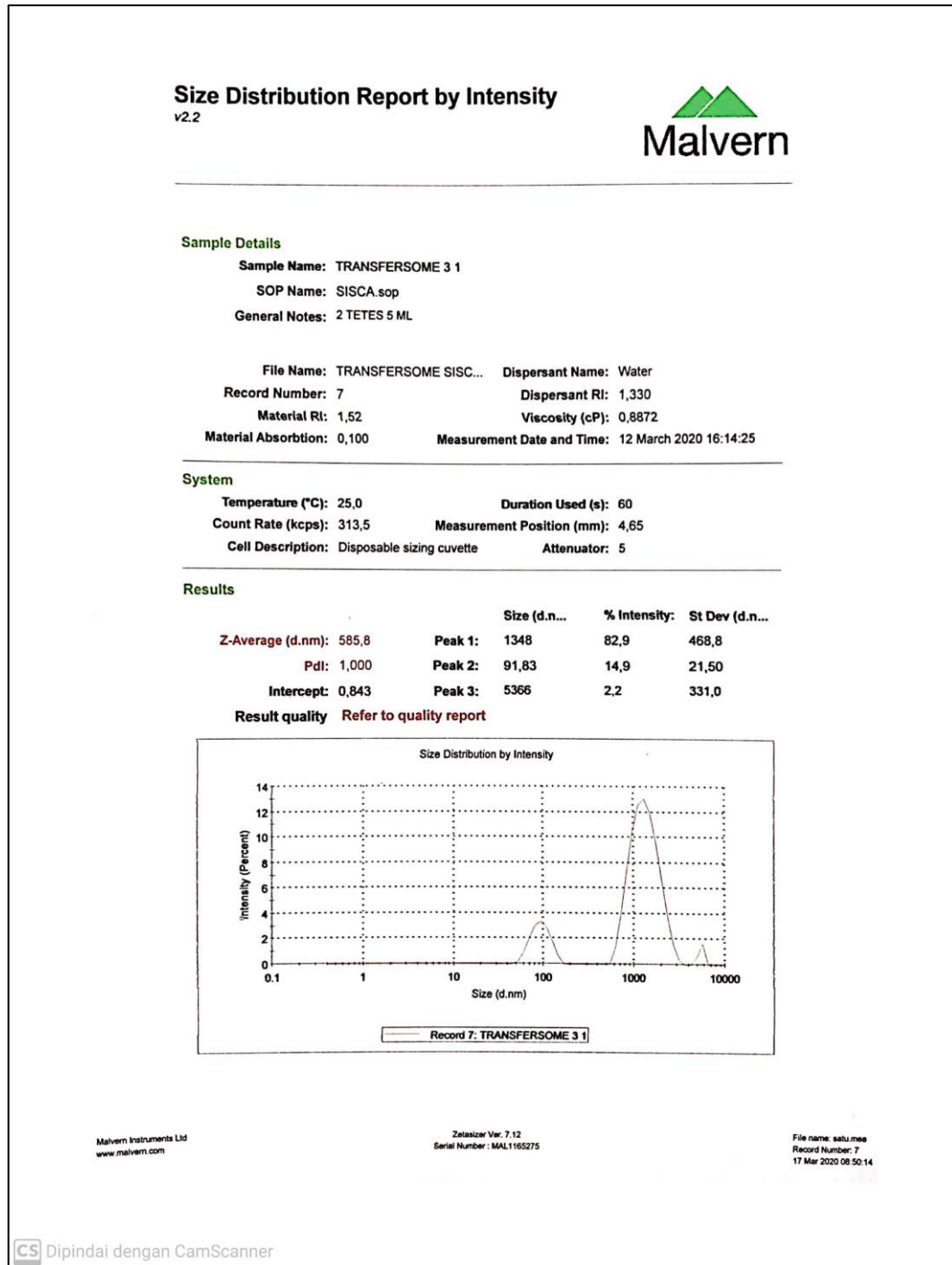
	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 565,2	Peak 1: 1223	78,8	527,9
Pdl: 0,916	Peak 2: 180,8	13,7	63,95
Intercept: 0,852	Peak 3: 53,79	4,3	13,29

Result quality Refer to quality report



1.5.2 Uji Ukuran Partikel Formula II

a. Replikasi 1



b. Replikasi 2

Size Distribution Report by Intensity
v2.2

Sample Details

Sample Name: TRANSFERSOME 3 2

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISC... Dispersant Name: Water

Record Number: 8 Dispersant RI: 1,330

Material RI: 1,52 Viscosity (cP): 0,8872

Material Absorbition: 0,100 Measurement Date and Time: 12 March 2020 16:16:41

System

Temperature (°C): 25,0 Duration Used (s): 60

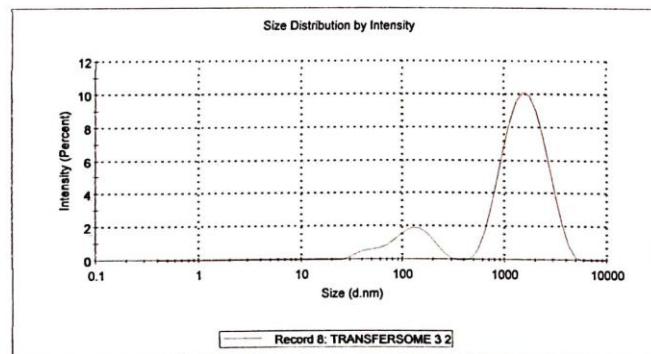
Count Rate (kcps): 311,6 Measurement Position (mm): 4,65

Cell Description: Disposable sizing cuvette Attenuator: 5

Results

	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 665,0	Peak 1: 1687	83,8	762,5
Pdl: 0,699	Peak 2: 118,7	16,2	55,36
Intercept: 0,834	Peak 3: 0,000	0,0	0,000

Result quality Refer to quality report



c. Replikasi 3

Size Distribution Report by Intensity v2.2



Sample Details

Sample Name: TRANSFERSOME 3 3

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISC... Dispersant Name: Water

Record Number: 9 Dispersant RI: 1,330

Material RI: 1,52 Viscosity (cP): 0,8872

Material Absorbtion: 0,100 Measurement Date and Time: 12 March 2020 16:18:55

System

Temperature (°C): 25,0 Duration Used (s): 60

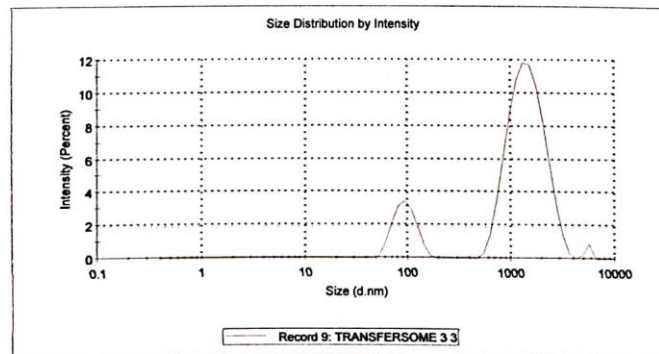
Count Rate (kcps): 310,1 Measurement Position (mm): 4,65

Cell Description: Disposable sizing cuvette Attenuator: 5

Results

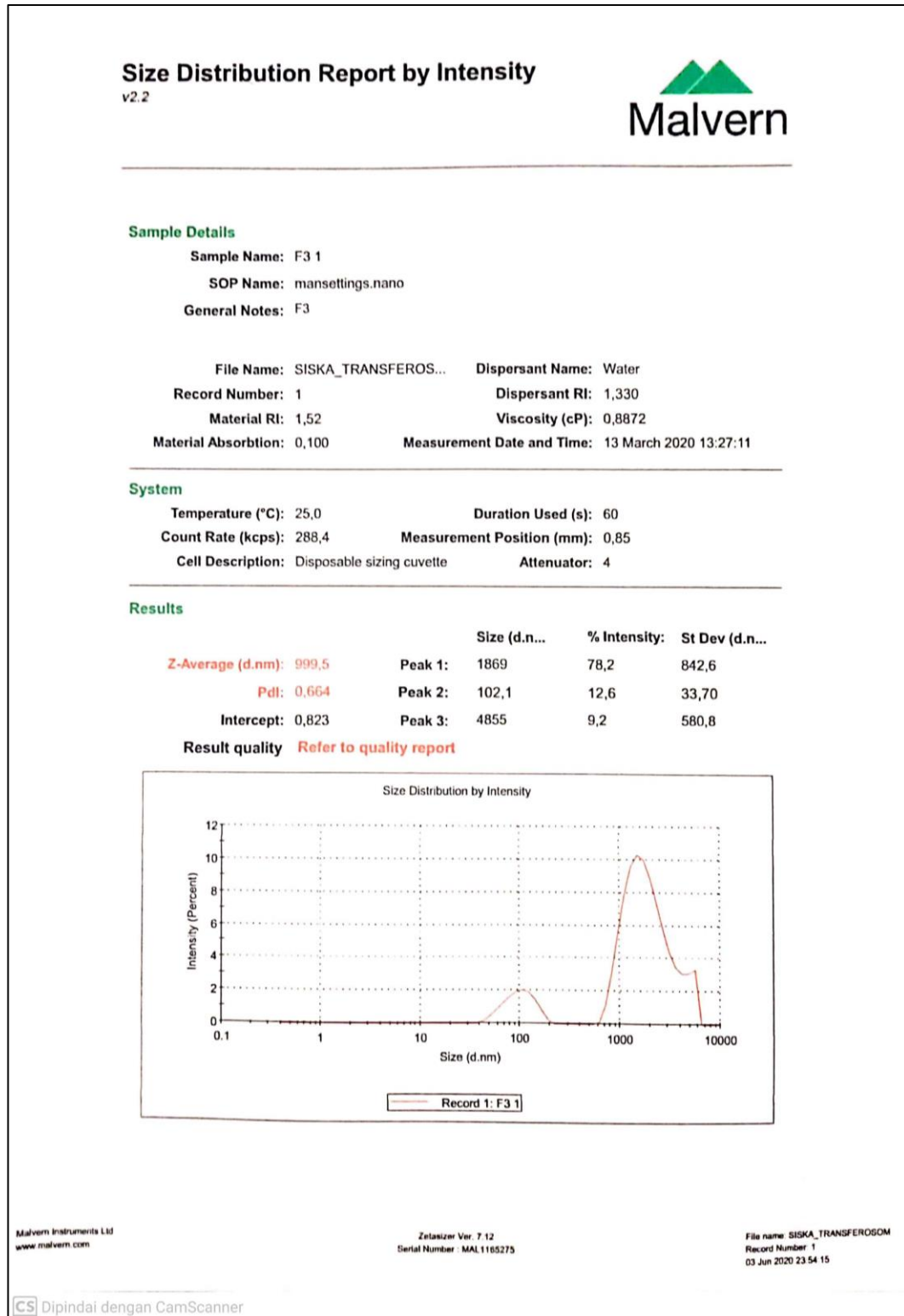
	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 675,8	Peak 1: 1473	83,6	566,4
PdI: 0,724	Peak 2: 93,12	15,2	22,10
Intercept: 0,837	Peak 3: 5403	1,1	307,3

Result quality Refer to quality report



1.5.3 Uji Ukuran Partikel Formula III

a. Replikasi 1



b. Replikasi 2

Size Distribution Report by Intensity

v2.2



Sample Details

Sample Name: F3 2
 SOP Name: mansettings.nano
 General Notes: F3

File Name: SISKA_TRANSFEROS... Dispersant Name: Water
 Record Number: 2 Dispersant RI: 1,330
 Material RI: 1,52 Viscosity (cP): 0,8872
 Material Absorbtion: 0,100 Measurement Date and Time: 13 March 2020 13:29:27

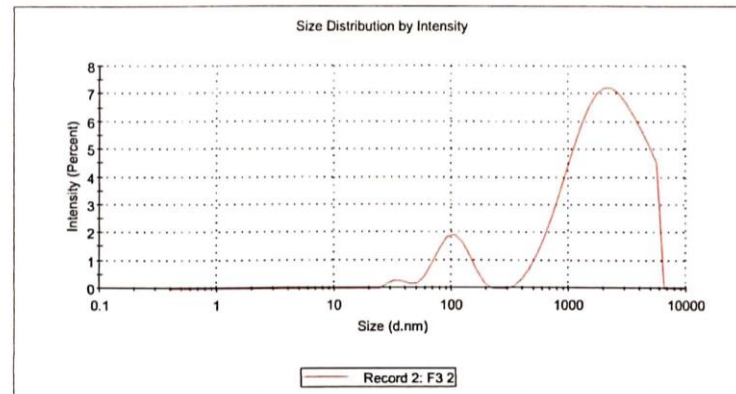
System

Temperature (°C): 25,0 Duration Used (s): 60
 Count Rate (kcps): 292,4 Measurement Position (mm): 0,85
 Cell Description: Disposable sizing cuvette Attenuator: 4

Results

	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 1061	Peak 1: 2387	88,4	1383
Pdl: 0,697	Peak 2: 104,3	10,7	31,51
Intercept: 0,843	Peak 3: 35,38	0,9	5,206

Result quality [Refer to quality report](#)



c. Replikasi 3

Size Distribution Report by Intensity

v2.2



Sample Details

Sample Name: F3 3

SOP Name: mansettings.nano

General Notes: F3

File Name: SISKI_TRANSFEROS...

Dispersant Name: Water

Record Number: 3

Dispersant RI: 1,330

Material RI: 1,52

Viscosity (cP): 0,8872

Material Absorption: 0,100

Measurement Date and Time: 13 March 2020 13:31:43

System

Temperature (°C): 25,0

Duration Used (s): 60

Count Rate (kcps): 301,0

Measurement Position (mm): 0,85

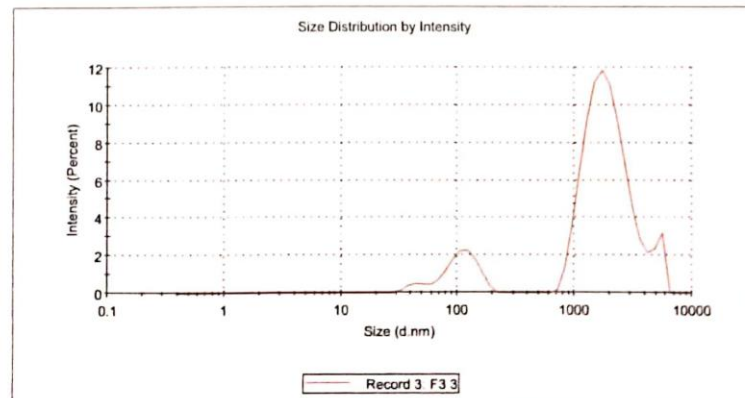
Cell Description: Disposable sizing cuvette

Attenuator: 4

Results

	Size (d.nm)	% Intensity	St Dev (d.nm)
Z-Average (d.nm): 898,0	Peak 1: 1924	78,9	756,3
Pdl: 1,000	Peak 2: 112,8	11,6	31,11
Intercept: 0,822	Peak 3: 4933	7,6	584,1

Result quality Refer to quality report



1.5.4 Uji Ukuran Partikel Formula IV

a. Replikasi 1

Size Distribution Report by Intensity v2.2



Sample Details

Sample Name: TRANSFERSOME 4 1

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISC... Dispersant Name: Water

Record Number: 13 Dispersant RI: 1,330

Material RI: 1,52 Viscosity (cP): 0,8872

Material Absorption: 0,100 Measurement Date and Time: 12 March 2020 16:32:20

System

Temperature (°C): 25,0 Duration Used (s): 70

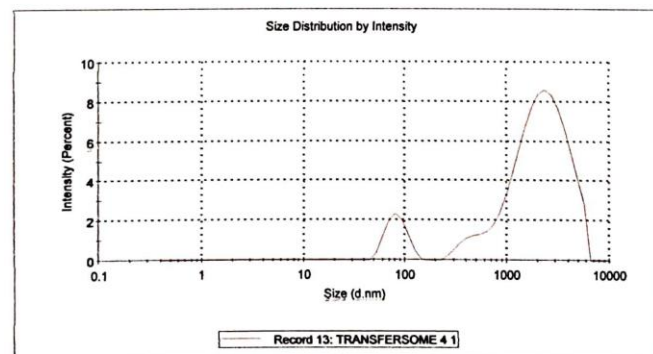
Count Rate (kcps): 202,0 Measurement Position (mm): 0,85

Cell Description: Disposable sizing cuvette Attenuator: 3

Results

	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 1018	Peak 1: 2310	90,3	1286
Pdl: 0,672	Peak 2: 81,69	9,7	18,36
Intercept: 0,769	Peak 3: 0,000	0,0	0,000

Result quality Refer to quality report



b. Replikasi 2

Size Distribution Report by Intensity

v2.2



Sample Details

Sample Name: TRANSFERSOME 4 2

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISC... Dispersant Name: Water

Record Number: 14 Dispersant RI: 1,330

Material RI: 1,52 Viscosity (cP): 0,8872

Material Absorbtion: 0,100 Measurement Date and Time: 12 March 2020 16:34:54

System

Temperature (°C): 25,0 Duration Used (s): 70

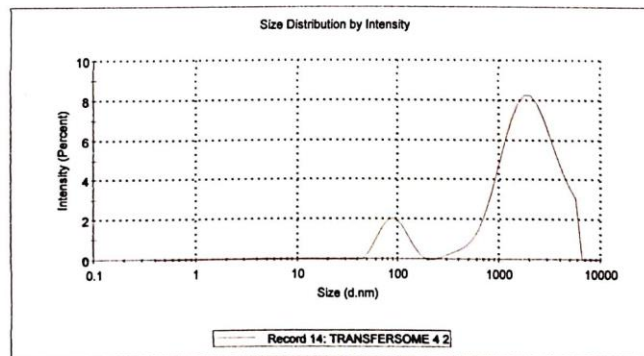
Count Rate (kcps): 207,5 Measurement Position (mm): 0,85

Cell Description: Disposable sizing cuvette Attenuator: 3

Results

	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 1002	Peak 1: 2200	89,0	1265
Pdl: 0,659	Peak 2: 90,83	11,0	25,61
Intercept: 0,755	Peak 3: 0,000	0,0	0,000

Result quality Refer to quality report



c. Replikasi 3

Size Distribution Report by Intensity v2.2



Sample Details

Sample Name: TRANSFERSOME 4 3

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISC... Dispersant Name: Water
Record Number: 15 Dispersant RI: 1,330
Material RI: 1,52 Viscosity (cP): 0,8872
Material Absorbion: 0,100 Measurement Date and Time: 12 March 2020 16:37:27

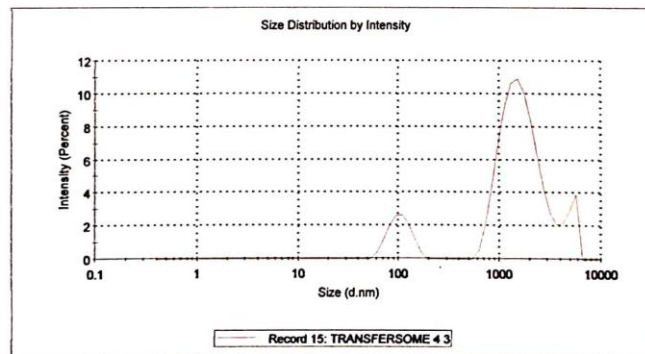
System

Temperature (°C): 25,0 Duration Used (s): 70
Count Rate (kcps): 206,0 Measurement Position (mm): 0,85
Cell Description: Disposable sizing cuvette Attenuator: 3

Results

	Size (d.n...	% Intensity:	St Dev (d.n...
Z-Average (d.nm): 851,2	Peak 1: 1629	77,0	666,6
PdI: 1,000	Peak 2: 102,2	12,1	24,74
Intercept: 0,767	Peak 3: 4711	10,9	747,4

Result quality Refer to quality report



Malvern Instruments Ltd
www.malvern.com

Zetasizer Ver. 7.12
Serial Number : MAL1165275

File name: satu.mea
Record Number: 15
17 Mar 2020 08:53:07

1.6 HASIL ZETA POTENSIAL

1.6.1 Zeta Potential Formula I

a. Replikasi 1

Zeta Potential Report

v2.3

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Sample Details

Sample Name: TRANSFERSOME SISCA 1 1

SOP Name: mansettings.nano

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water

Record Number: 4 Dispersant RI: 1,330

Date and Time: 12 March 2020 16:03:54 Viscosity (cP): 0,8872

Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 12

Count Rate (kcps): 418,5 Measurement Position (mm): 4,50

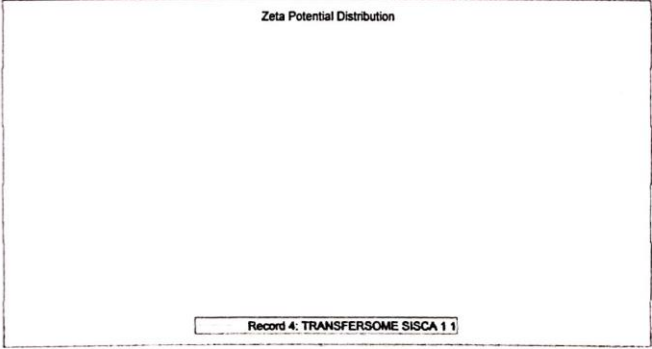
Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -15,7	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 4,81	Peak 3: 0,00	0,0	0,00

Result quality Good

Zeta Potential Distribution



Record 4: TRANSFERSOME SISCA 1 1

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www.malvern.com

Zetasizer V10

Serial Number: MAL1185275

File name: satu.mea

Record Number: 4

17 Mar 2020 08:54:52

 Dipindai dengan CamScanner

b. Replikasi 2

Zeta Potential Report

v2.3



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Sample Details

Sample Name: TRANSFERSOME SISCA 1 2

SOP Name: mansettings.nano

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water
 Record Number: 5 Dispersant RI: 1,330
 Date and Time: 12 March 2020 16:06:10 Viscosity (cP): 0,8872
 Dispersant Dielectric Constant: 78,5

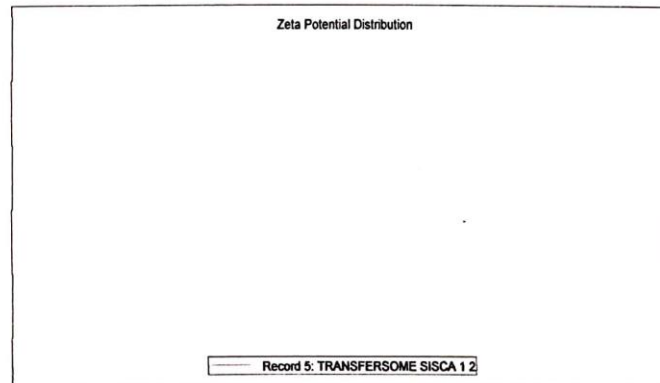
System

Temperature (°C): 25,0 Zeta Runs: 12
 Count Rate (kcps): 305,4 Measurement Position (mm): 4,50
 Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -15,9	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 5,12	Peak 3: 0,00	0,0	0,00

Result quality Good



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 www.malvern.com

Zetasizer Ver: 7.12
 Serial Number: MAL1165275

File name: satu.mea
 Record Number: 5
 17 Mar 2020 06:55:20

c. Replikasi 3

Zeta Potential Report

v2.3

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Sample Details

Sample Name: TRANSFERSOME SISCA 1 3

SOP Name: mansettings.nano

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water

Record Number: 6 Dispersant RI: 1,330

Date and Time: 12 March 2020 16:06:33 Viscosity (cP): 0,8872

Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 12

Count Rate (kcps): 364,8 Measurement Position (mm): 4,50

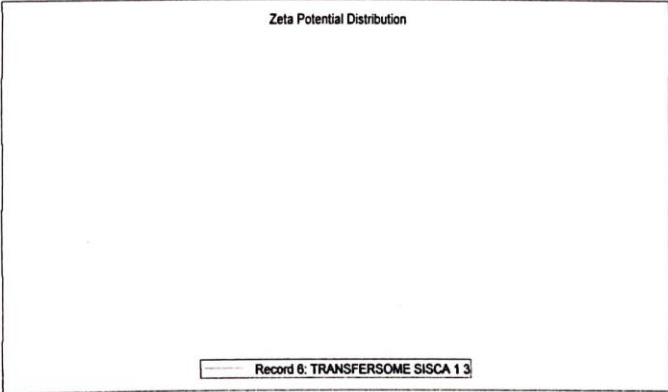
Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -17,7	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 5,77	Peak 3: 0,00	0,0	0,00

Result quality Good

Zeta Potential Distribution



Record 8: TRANSFERSOME SISCA 1 3

Malvern Instruments Ltd
www.malvern.com

Zetasizer Ver. 7.12
Serial Number: MAL1165275

File name: satu.mea
Record Number: 6
17 Mar 2020 08:55:58


Dipindai dengan CamScanner

1.6.2 Zeta Potential Formula II

a. Replikasi 1

Zeta Potential Report

v2.3

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Sample Details

Sample Name: TRANSFERSOME SISCA 3 1
 SOP Name: SISCA.sop
 General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water
 Record Number: 10 Dispersant RI: 1,330
 Date and Time: 12 March 2020 16:20:12 Viscosity (cP): 0,8872
 Dispersant Dielectric Constant: 78,5

System

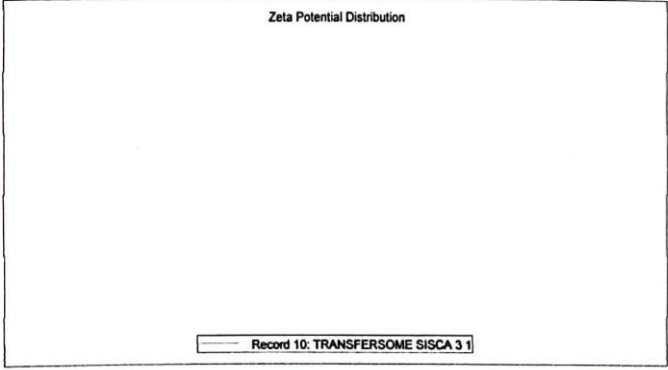
Temperature (°C): 25,0 Zeta Runs: 39
 Count Rate (kcps): 297,5 Measurement Position (mm): 4,50
 Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -3,83	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 5,42	Peak 3: 0,00	0,0	0,00

Result quality Good

Zeta Potential Distribution



Record 10: TRANSFERSOME SISCA 3 1

Malvern Instruments Ltd
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Zetasizer Ver. 7.12
Serial Number: MAL1165275

File name: satu.mea
Record Number: 10
17 Mar 2020 08:56:17

 Dipindai dengan CamScanner

b. Replikasi 2

Zeta Potential Report

v2.3



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Sample Details

Sample Name: TRANSFERSOME SISCA 3 2

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water
 Record Number: 11 Dispersant RI: 1,330
 Date and Time: 12 March 2020 16:23:07 Viscosity (cP): 0,8872
 Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 17
 Count Rate (kcps): 349,1 Measurement Position (mm): 4,50
 Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -4,22	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 5,94	Peak 3: 0,00	0,0	0,00

Result quality **Good**

Zeta Potential Distribution

Record 11: TRANSFERSOME SISCA 3 2

Malvern Instruments Ltd
 www.malvern.com

Zetasizer Ver. 7.12
 Serial Number: MAL1185275

File name: satu.mea
 Record Number: 11
 17 Mar 2020 08:56:37

c. Replikasi 3

Zeta Potential Report

v2.3



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Sample Details

Sample Name: TRANSFERSOME SISCA 3 3

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water
 Record Number: 12 Dispersant RI: 1,330
 Date and Time: 12 March 2020 16:23:37 Viscosity (cP): 0,8872
 Dispersant Dielectric Constant: 78,5

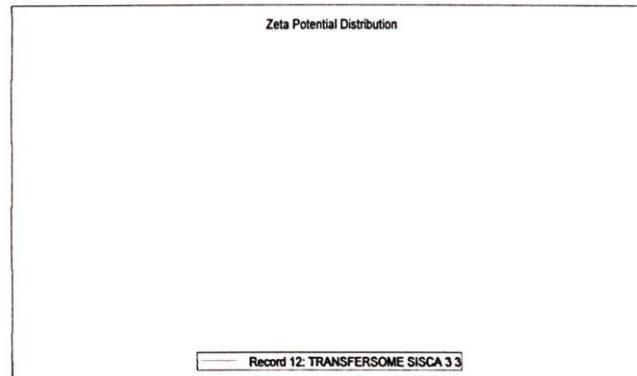
System

Temperature (°C): 25,0 Zeta Runs: 59
 Count Rate (kcps): 305,9 Measurement Position (mm): 4,50
 Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -4,47	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 6,15	Peak 3: 0,00	0,0	0,00

Result quality **Good**



Malvern Instruments Ltd
www.malvern.com

Zetasizer Ver 7.12
Serial Number: MAL1165275

File name: satu.mea
Record Number: 12
17 Mar 2020 08:59:57

1.6.3 Zeta Potential Formula III

a. Replikasi 1

Zeta Potential Report

v2.3

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Sample Details

Sample Name: F3 3

SOP Name: mansettings.nano

General Notes: F3

File Name: SISKI_TRANSFEROSOM.... Dispersant Name: Water

Record Number: 6 Dispersant RI: 1,330

Date and Time: 13 March 2020 13:37:12 Viscosity (cP): 0,8872

Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 14

Count Rate (kcps): 275,6 Measurement Position (mm): 4,50

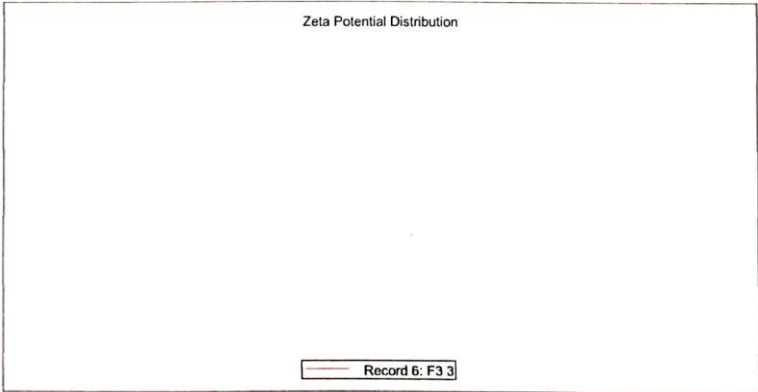
Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -8,39	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 6,11	Peak 3: 0,00	0,0	0,00

Result quality Good

Zeta Potential Distribution



Record 6: F3 3

Malvern Instruments Ltd
www.malvern.com

Zetasizer Ver. 7.12
Serial Number: MAL1165275

File name: SISKI_TRANSFEROSOM
Record Number: 6
03 Jun 2020 23.46.38



Dipindai dengan CamScanner

b. Replikasi 2

Zeta Potential Report

v2.3



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Sample Details

Sample Name: F3 2

SOP Name: mansettings.nano

General Notes: F3

File Name: SISKI_TRANSFEROSOM.... Dispersant Name: Water

Record Number: 5 Dispersant RI: 1,330

Date and Time: 13 March 2020 13:36:10 Viscosity (cP): 0,8872

Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 37

Count Rate (kcps): 368,3 Measurement Position (mm): 4,50

Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -8,10	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 5,95	Peak 3: 0,00	0,0	0,00

Result quality Good

Zeta Potential Distribution

Record 5: F3 2

Malvern Instruments Ltd
www.malvern.com

Zetasizer Ver. 7.12
Serial Number: MAL1165275

File name: SISKI_TRANSFEROSOM
Record Number: 5
03 Jun 2020 23:49:27

c. Replikasi 3

Zeta Potential Report

v2.3



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Sample Details

Sample Name: F3 1

SOP Name: mansettings.nano

General Notes: F3

File Name: SISKI_TRANSFEROSOM.... Dispersant Name: Water
 Record Number: 4 Dispersant RI: 1,330
 Date and Time: 13 March 2020 13:33:24 Viscosity (cP): 0,8872
 Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 12
 Count Rate (kcps): 157,0 Measurement Position (mm): 4,50
 Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -8,21	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 5,67	Peak 3: 0,00	0,0	0,00

Result quality **Good**

Zeta Potential Distribution

Record 4: F3 1

1.6.4 Zeta Potential Formula IV

a. Replikasi 1

Zeta Potential Report

v2.3

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Sample Details

Sample Name: TRANSFERSOME SISCA 4 1
 SOP Name: SISCA.sop
 General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water
 Record Number: 16 Dispersant RI: 1,330
 Date and Time: 12 March 2020 16:38:42 Viscosity (cP): 0,8872
 Dispersant Dielectric Constant: 78,5

System

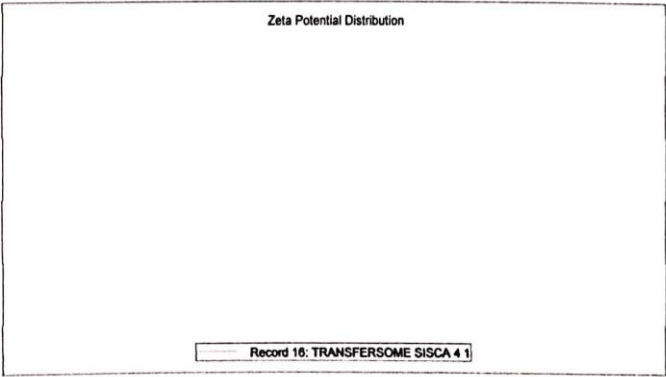
Temperature (°C): 25,0 Zeta Runs: 45
 Count Rate (kcps): 397,7 Measurement Position (mm): 4,50
 Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -4,03	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 5,89	Peak 3: 0,00	0,0	0,00

Result quality Good

Zeta Potential Distribution



Record 16: TRANSFERSOME SISCA 4 1

Malvern Instruments Ltd
www.malvern.com

Zetasizer Ver 7.12
Serial Number: MAL1165275

File name: satu.mea
Record Number: 16
17 Mar 2020 08:57:16

 Dipindai dengan CamScanner

b. Replikasi 2

Zeta Potential Report

v2.3



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Sample Details

Sample Name: TRANSFERSOME SISCA 4 2

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water
 Record Number: 17 Dispersant RI: 1,330
 Date and Time: 12 March 2020 16:41:50 Viscosity (cP): 0,8872
 Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 63
 Count Rate (kcps): 434,3 Measurement Position (mm): 4,50
 Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -4,09	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 6,22	Peak 3: 0,00	0,0	0,00

Result quality **Good**

Zeta Potential Distribution

Record 17: TRANSFERSOME SISCA 4 2

Malvern Instruments Ltd
www.malvern.com

Zetasizer Ver. 7.12
Serial Number: MAL1165275

File name: satl.mea
Record Number: 17
17 Mar 2020 08:57:34

c. Replikasi 3

Zeta Potential Report
v2.3

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Sample Details

Sample Name: TRANSFERSOME SISCA 4 3

SOP Name: SISCA.sop

General Notes: 2 TETES 5 ML

File Name: TRANSFERSOME SISCA.dts Dispersant Name: Water
Record Number: 18 Dispersant RI: 1,330
Date and Time: 12 March 2020 16:43:32 Viscosity (cP): 0,8872
Dispersant Dielectric Constant: 78,5

System

Temperature (°C): 25,0 Zeta Runs: 49
Count Rate (kcps): 342,2 Measurement Position (mm): 4,50
Cell Description: Zeta dip cell Attenuator: 3

Results

	Mean (mV)	Area (%)	St Dev (mV)
Zeta Potential (mV): -4,16	Peak 1: 0,00	0,0	0,00
Zeta Deviation (mV): 0,00	Peak 2: 0,00	0,0	0,00
Conductivity (mS/cm): 6,33	Peak 3: 0,00	0,0	0,00

Result quality **Good**

Zeta Potential Distribution

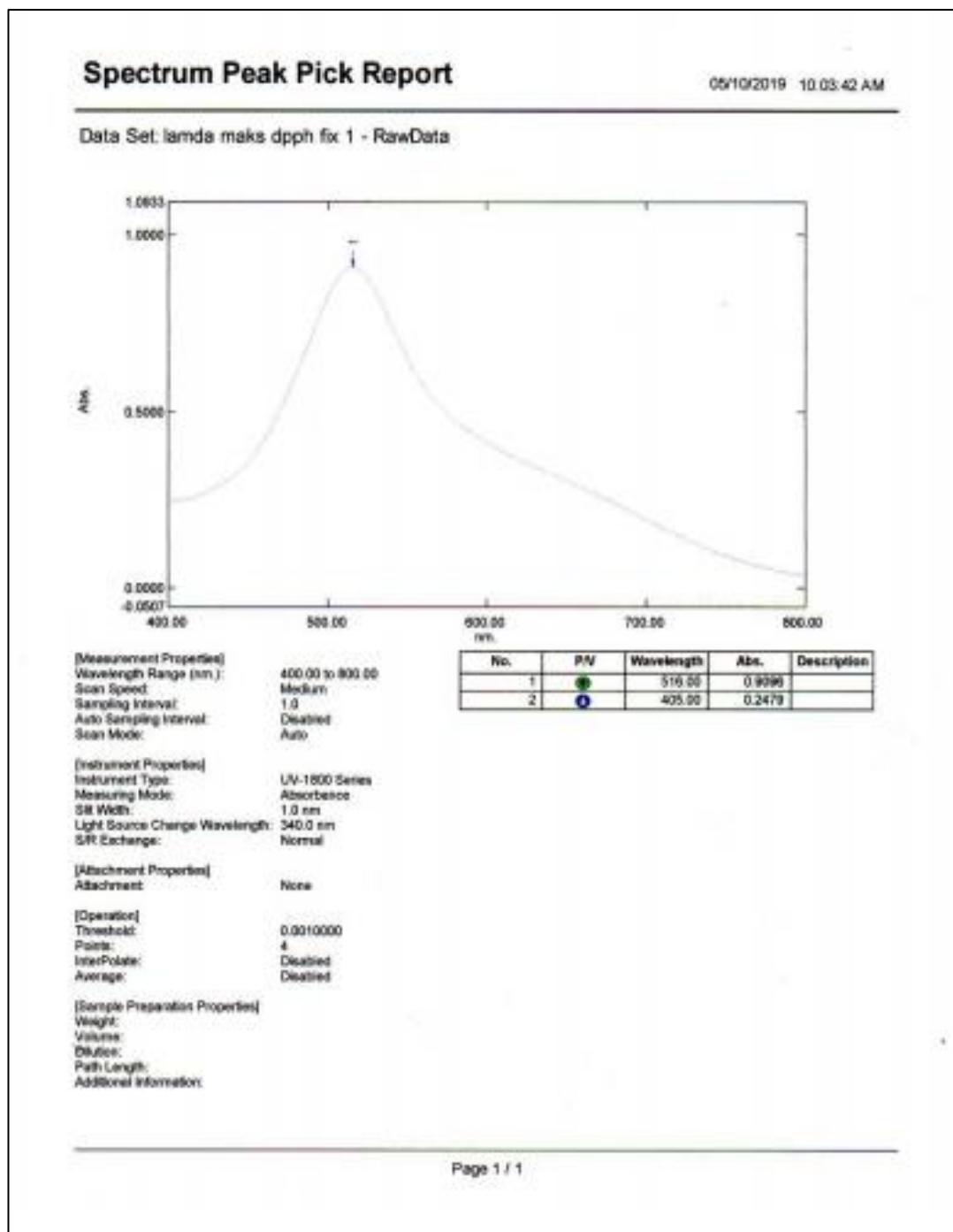
Record 18: TRANSFERSOME SISCA 4 3

Malvern Instruments Ltd
www.malvern.comZetasizer Ver 7.12
Serial Number: MAL1165275File name: satu.mes
Record Number: 18
17 Mar 2020 08:57:52

Lampiran 7. Serum

1. Uji Aktifitas antioksidan

a. Penentuan panjang gelombang maks



b. Penentuan *operating time*

OT Fickin DPPH 4/5 13
60 MEHIT

06/04/2019 12:24:22 PM

Kinetics Data Print Report

Time (Minute)	RawData ...
0.000	0.198
1.000	0.198
2.000	0.198
3.000	0.198
4.000	0.198
5.000	0.198
6.000	0.198
7.000	0.198
8.000	0.198
9.000	0.198
10.000	0.198
11.000	0.198
12.000	0.198
13.000	0.199
14.000	0.198
15.000	0.199
16.000	0.199
17.000	0.199
18.000	0.199
19.000	0.199
20.000	0.199
21.000	0.199
22.000	0.199
23.000	0.199
24.000	0.199
25.000	0.199
26.000	0.199
27.000	0.199
28.000	0.199
29.000	0.199
30.000	0.199
31.000	0.199
32.000	0.199
33.000	0.199
34.000	0.200
35.000	0.200
36.000	0.199
37.000	0.200
38.000	0.200
39.000	0.200
40.000	0.200
41.000	0.200
42.000	0.200
43.000	0.200
44.000	0.200
45.000	0.200
46.000	0.200
47.000	0.200
48.000	0.200
49.000	0.200
50.000	0.200

Page 1 / 2

Kinetics Data Print Report

05/04/2019 12:24:22 PM

Time (Minute)	RawData ...
51.000	0.201
52.000	0.200
53.000	0.200
54.000	0.201
55.000	0.201
56.000	0.201
57.000	0.201
58.000	0.201
59.000	0.201
60.000	0.201

c. DPPH fisetin

Perhitungan bahan fisetin :

$$50\text{mg}/100\text{ml} = 500\text{mg}/1000\text{ml} = 500 \text{ ppm}$$

Perhitungan konsentrasi (ppm) :

- 1) $V_1 \times N_1 = V_2 \times N_2$
 $500 \text{ ppm} \times 0,3112\text{ml} = V_2 \times 10\text{ml}$
 $V_2 = 15,56 \text{ ppm}$
- 2) $V_1 \times N_1 = V_2 \times N_2$
 $500 \text{ ppm} \times 0,1556\text{ml} = V_2 \times 10\text{ml}$
 $V_2 = 7,78 \text{ ppm}$
- 3) $V_1 \times N_1 = V_2 \times N_2$
 $500 \text{ ppm} \times 0,0778\text{ml} = V_2 \times 10\text{ml}$
 $V_2 = 3,89 \text{ ppm}$
- 4) $V_1 \times N_1 = V_2 \times N_2$
 $500 \text{ ppm} \times 0,039\text{ml} = V_2 \times 10\text{ml}$
 $V_2 = 1,95 \text{ ppm}$
- 5) $V_1 \times N_1 = V_2 \times N_2$
 $500 \text{ ppm} \times 0,0194\text{ml} = V_2 \times 10\text{ml}$
 $V_2 = 0,97 \text{ ppm}$

a. Replikasi I

Konsentrasi (ppm)	Absorbansi	% Inhibisi
15,56	0,212	76,7
7,78	0,405	55,5
3,89	0,507	44,3
1,95	0,555	39,0
0,97	0,578	36,5

Persamaan regresi linier antara absorbansi dan % inhibisi diperoleh nilai :

$$a = 33,6727$$

$$b = 2,7696$$

$$r = 0,99994$$

$$y = a + bx$$

$$y = 33,6727 + 2,7696x$$

keterangan :

x = konsentrasi (ppm)

$$y = 50$$

Perhitungan IC50 fisetin

$$50 = a + bx$$

$$50 = 33,6727 + 2,7696x$$

$$33,6272x = 16,3273$$

$$x = 5,89 \text{ ppm}$$

b. Replikasi II

Konsentrasi (ppm)	Absorbansi	% Inhibisi
15,56	0,222	75,7
7,78	0,416	54,3
3,89	0,509	44,0
1,95	0,557	38,8
0,97	0,578	36,5

Persamaan regresi linier antara absorbansi dan % inhibisi diperoleh nilai :

$$a = 33,5812$$

$$b = 2,6973$$

$$r = 0,9999$$

$$y = a + bx$$

$$y = 33,58124 + 2,6973x$$

keterangan :

x = konsentrasi (ppm)

$$y = 50$$

Perhitungan IC₅₀ fisetin

$$50 = a + bx$$

$$50 = 33,5812 + 2,6973x$$

$$33,5812x = 16,4188$$

$$x = 6,09 \text{ ppm}$$

c. Replikasi III

Konsentrasi (ppm)	Absorbansi	% Inhibisi
15,56	0,224	75,4
7,78	0,418	54,0
3,89	0,511	43,8
1,95	0,559	38,5
0,97	0,588	35,4

Persamaan regresi linier antara absorbansi dan % inhibisi diperoleh nilai :

$$a = 33,0177$$

$$b = 2,7215$$

$$r = 0,9999$$

$$y = a + bx$$

$$y = 33,0177 + 2,7215x$$

keterangan :

x = konsentrasi (ppm)

$$y = 50$$

Perhitungan IC50 fisetin

$$50 = a + bx$$

$$50 = 33,0177 + 2,7215x$$

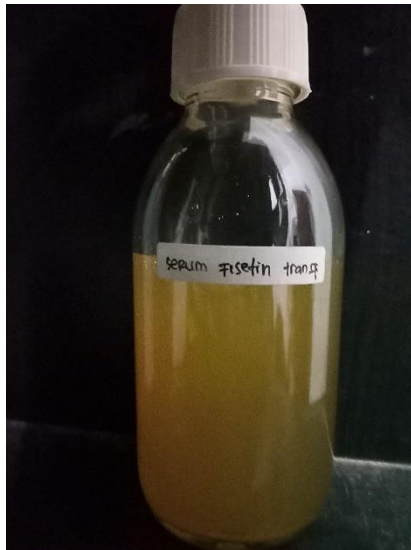
$$33,0177x = 16,9823$$

$$x = 6,24 \text{ ppm}$$

Rata-rata IC50 Fisetin :

$$\left. \begin{array}{l} \text{Replikasi I} = 5,89 \text{ ppm} \\ \text{Replikasi II} = 6,09 \text{ ppm} \\ \text{Replikasi III} = 6,24 \text{ ppm} \end{array} \right\} 6,07 \text{ ppm}$$

2. Uji ORGANOLEPTIK SERUM



Hari-1

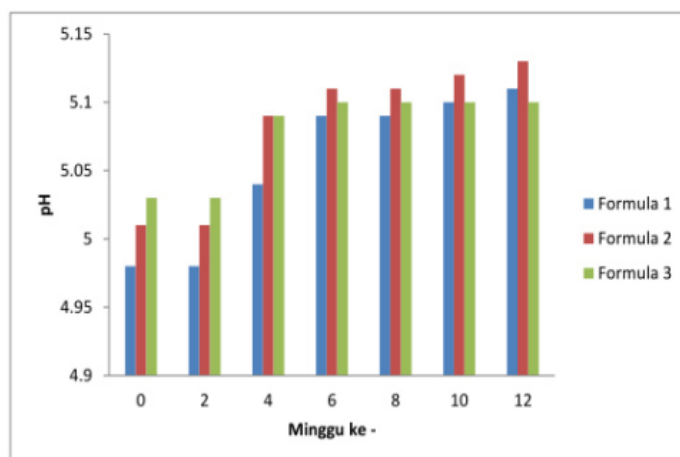


Hari-21

3. Uji pH

Jurnal Mardiyanti *et al.* (2016) yang berjudul Formulasi Serum sebagai Penyembuh Luka Bakar Berbahan Baku Utama Serbuk Konsentrat Ikan Gabus (*Channa striatus*)

FORMULA	pH
1	4,98
2	5,01
3	5,02



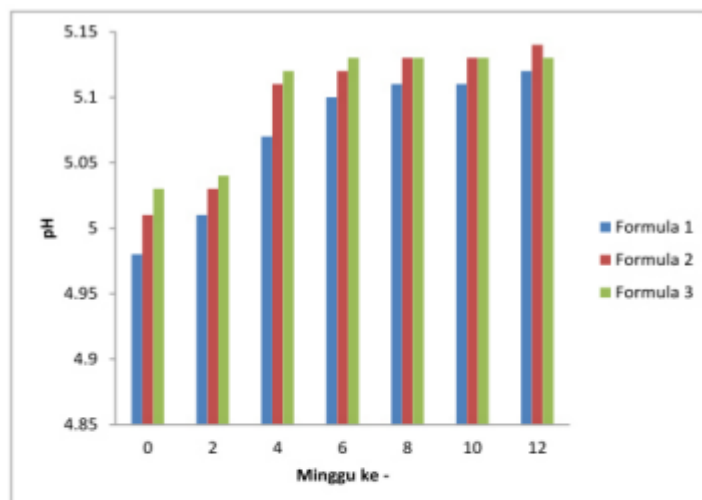
Gambar 3.Hasil pengukuran pH sediaan serum pada suhu kamar (29 ± 2)° C.

Keterangan :

Formula 1 : Serum yang mengandung suspensi nanopartikel dengan konsentrasi 7,5 %

Formula 2 : Serum yang mengandung suspensi nanopartikel dengan konsentrasi 10 %

Formula 3 : Serum yang mengandung suspensi nanopartikel dengan konsentrasi 12,5 %



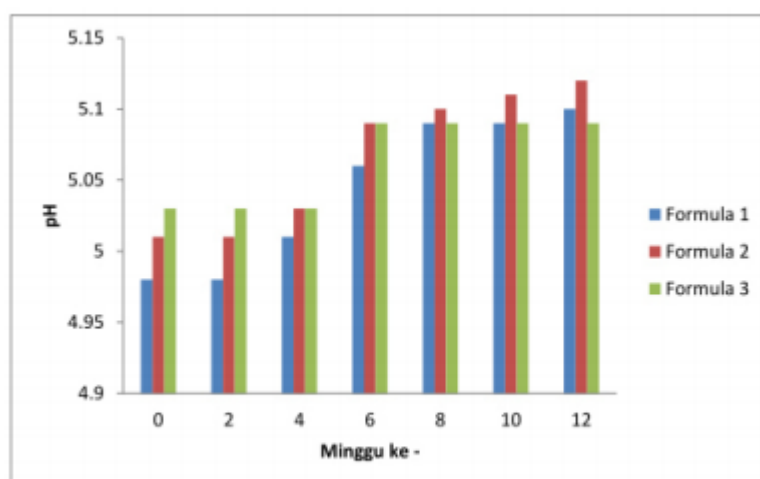
Gambar 4. Hasil pengukuran pH sediaan serum pada suhu panas (40 ± 2)° C.

Keterangan :

Formula 1 : Serum yang mengandung suspensi nanopartikel dengan konsentrasi 7,5 %

Formula 2 : Serum yang mengandung suspensi nanopartikel dengan konsentrasi 10 %

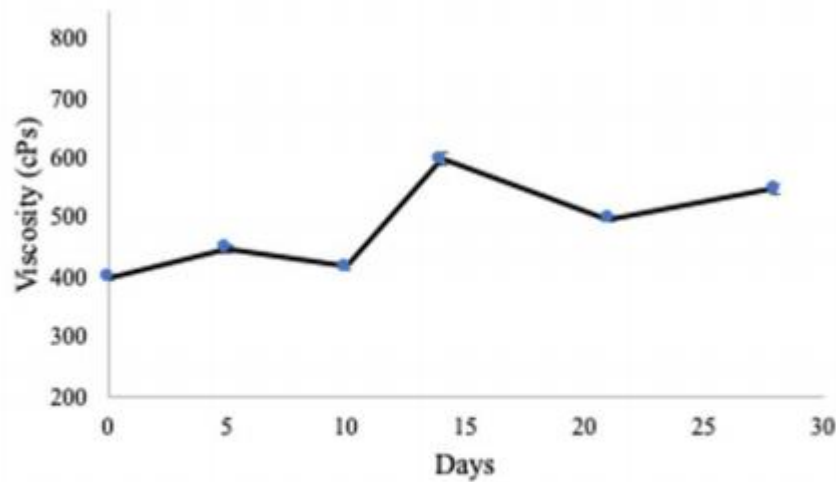
Formula 3 : Serum yang mengandung suspensi nanopartikel dengan konsentrasi 12,5 %



Gambar 5. Hasil pengukuran pH sediaan serum pada suhu dingin (4 ± 2)° C.

pH berdasarkan hasil evaluasi sediaan serum oleh Mardiyanti *et al.* 2016.

4. UJI VISKOSITAS



Gambar. 2: Viskositas gel serum yang mengandung ekstrak daun AK (The data dihitung sebagai rata-rata $\pm$ SD; n = 3)

Hasil viskositas menunjukkan bahwa viskositas gel serum yang mengandung ekstrak daun AK tidak berubah secara signifikan setelah penyimpanan 28 hari dan tetap dalam viskositas yang dapat diterima untuk gel serum. Nilai viskositas gel serum yang dapat diterima adalah dalam kisaran 230-1150 cPs (Aulifa 2020).