BAB V
KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan dari hasil penelitian yang telah dilakukan dapat diperoleh kesimpulan bahwa:

Pertama, myrisetin dapat dibuat sediaan serum yang memenuhi uji mutu fisik seediaan meliputi uji organoleptis, pH, dan viskositas.

Kedua, formula 1, formula 2 dan formula 3 serum myrisetin tidak stabil secara fisik selama proses penyimpanan dengan berbagai variasi konsentrasi *sodium gluconate*.

B. Saran

Penelitian ini masih banyak kekurangan, maka perlu dilakukan penelitian lebih lanjut mengenai:

Pertama, perlu dilakukan uji DPPH sediaan serum myrisetin.

Kedua, perlu dilakukan uji difusi sel menggunakan menggunakan membran biologis untuk mengetahui serum myrisetin yang dapat berpenetrasi ke dalam kulit.

Ketiga, serum myrisetin dibuat dalam bentuk enkapsulasi.

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L A M P I R A N

Lampiran 1. Sertifikat analisis myrisetin.

TOCRIS
a bio-techne brand

Print Date: Jul 20th 2017

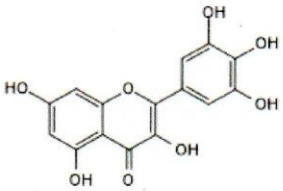
Certificate of Analysis

www.tocris.com

Product Name: **Myricetin** **Catalog No.: 6189** **Batch No.: 1**
CAS Number: 529-44-2
IUPAC Name: 3,5,7-Trihydroxy-2-(3,4,5-trihydroxyphenyl)-4*H*-1-benzopyran-4-one

1. PHYSICAL AND CHEMICAL PROPERTIES

Batch Molecular Formula: $C_{15}H_{10}O_8 \cdot H_2O$
Batch Molecular Weight: 336.26
Physical Appearance: Yellow solid
Solubility: DMSO to 100 mM
ethanol to 50 mM
Storage: Store at -20°C
Batch Molecular Structure:



2. ANALYTICAL DATA

HPLC: Shows 97.7% purity
^{1}H NMR: Consistent with structure
Mass Spectrum: Consistent with structure
Microanalysis:

	Carbon	Hydrogen	Nitrogen
Theoretical	53.58	3.6	
Found	53.6	3.57	

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

bio-techne.com
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techsupport@bio-techne.com

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Europe Middle East Africa
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TOCRIS
a bio-techne brand

Print Date: Jul 20th 2017

Product Information

www.tocris.com

Product Name: **Myricetin** **Catalog No.: 6189** **Batch No.: 1**

CAS Number: 529-44-2

IUPAC Name: 3,5,7-Trihydroxy-2-(3,4,5-trihydroxyphenyl)-4*H*-1-benzopyran-4-one

Description:

Irreversible TrxR inhibitor (IC_{50} = 0.62 µM). Exhibits concentration-, time- and NADH-dependent TrxR inhibition. Results in the oxidation of Trx and reduced TrxR activity in vitro in addition to the accumulation of cells in sub-G_1 phase. Reduces neoplastic transformation and induces cell death in cancer cell lines. Chemotherapeutic.

Physical and Chemical Properties:

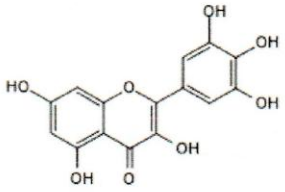
Batch Molecular Formula: $C_{15}H_{10}O_8.H_2O$

Batch Molecular Weight: 336.26

Physical Appearance: Yellow solid

Minimum Purity: >97%

Batch Molecular Structure:



Storage: Store at -20°C

CAUTION - This product is light sensitive and we recommend that the solid material and any solutions obtained are protected from exposure to light.

Solubility & Usage Info:

DMSO to 100 mM
ethanol to 50 mM

Stability and Solubility Advice:

Some solutions can be difficult to obtain and can be encouraged by rapid stirring, sonication or gentle warming (in a 45-60°C water bath).

Information concerning product stability, particularly in solution, has rarely been reported and in most cases we can only offer a general guide. Our standard recommendations are:

SOLIDS: Provided storage is as stated on the product label and the vial is kept tightly sealed, the product can be stored for up to 6 months from date of receipt.

SOLUTIONS: We recommend that stock solutions, once prepared, are stored aliquoted in tightly sealed vials at -20°C or below and used within 1 month. Wherever possible solutions should be made up and used on the same day.

References:

Devi *et al* (2015) Molecular mechanisms underlying anticancer effects of myricetin. Life.Sci. ***142*** 19. PMID: 26455550.

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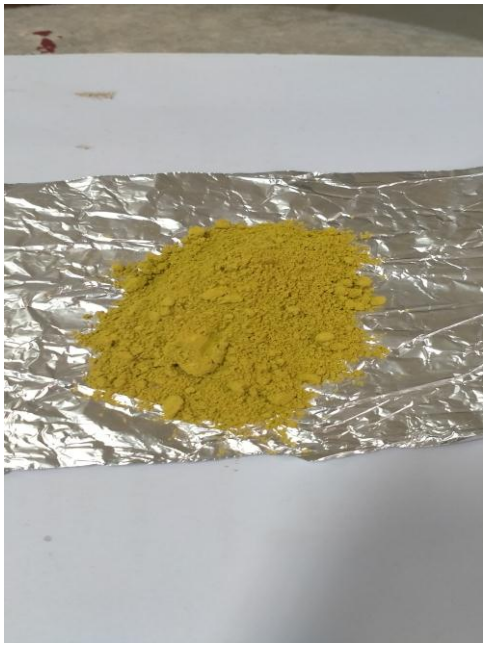
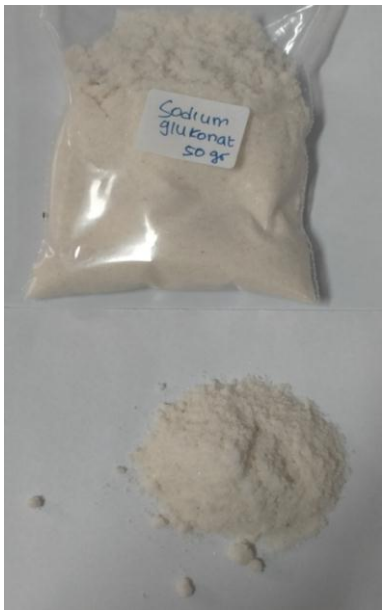
Lampiran 2. Gambar alat dan bahan penelitian

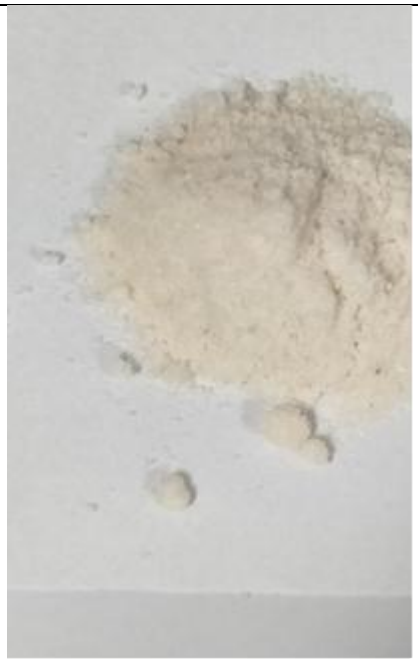
<table>
<tr><th colspan="2">Alat</th></tr>
<tr><td> 
Neraca analitik</td><td> 
Spektro uv-vis</td></tr>
<tr><td> 
Setirer</td><td> 
Pipet tetes</td></tr>
</table>

<table>
<tr><th colspan="2">Alat</th></tr>
<tr><td> 
Oven</td><td> 
Kulkas</td></tr>
<tr><td> 
Viskometer</td><td> 
pH meter</td></tr>
</table>

Alat	
 Pipet volume	 Botol serum
 Batang pengaduk	 Sedok tanduk

Bahan	
 Serbuk myrisetin	 gylcerin
 Sodium glukonat	 Optipen

Bahan

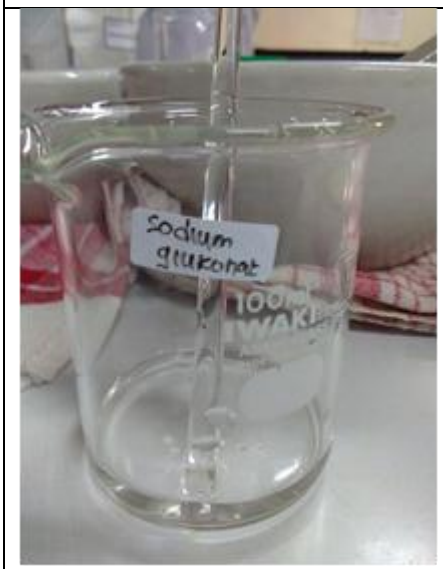


Xanthan gum

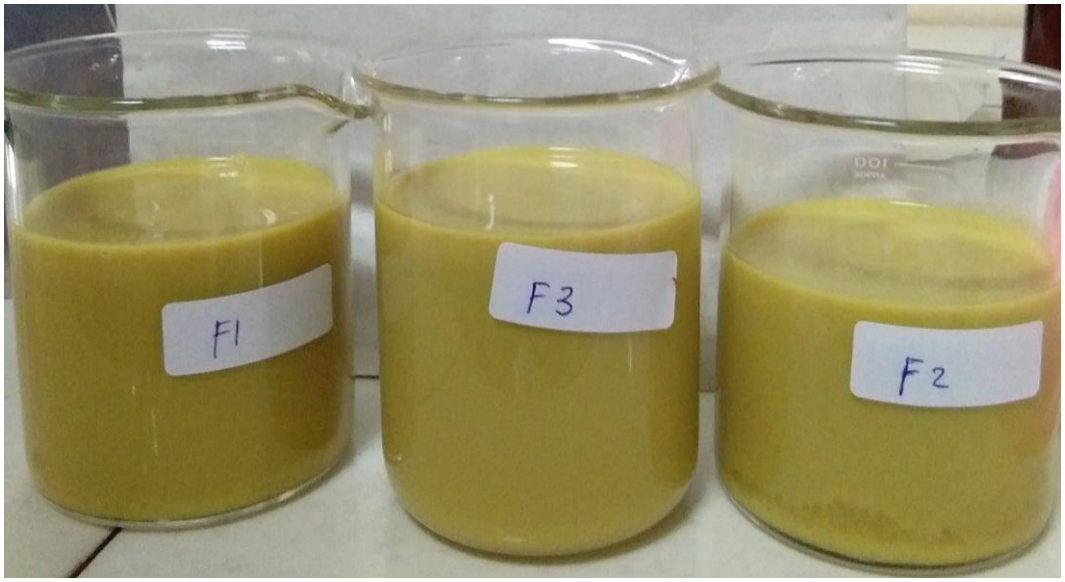
Aquadest

Hyaluronic acid

Lampiran 3. Cara pembuatan serum myrisetin.

<table>
<tr><td colspan="2">Cara pembuatan</td></tr>
<tr><td> 
Gambar.Mengembangkan *hyaluronic acid*</td><td> 
Gambar. Mengembangkan *xanthan gum*</td></tr>
<tr><td> 
Gambar. Melarutkan *sodium gluconate*</td><td> 
Gambar. Gliserin</td></tr>
</table>

Gambar. Pencampuran semua bahan menjadi satu sampai terbentuk serum



Sediaan serum myrisetin.

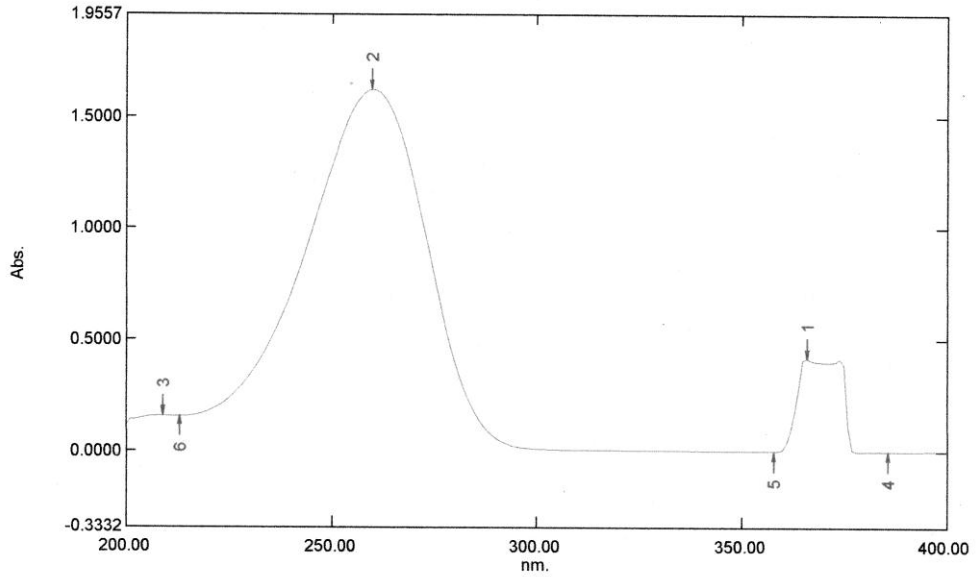
Lampiran 4. Pembuatan kurva kalibrasi dan validasi metode.

1. Penentuan panjang gelombang.

Spectrum Peak Pick Report

03/11/2020 10:37:06 AM

Data Set: File_200311_103334 - RawData



No.	P/V	Wavelength	Abs.	Description
1	↑	366.00	0.4199	
2	↑	260.00	1.6198	
3	↑	209.00	0.1580	
4	↓	386.00	0.0027	
5	↓	358.00	0.0036	
6	↓	213.00	0.1562	

[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:

2. *Operating Time* Mirisetin.

Kinetics Data Print Report

03/11/2020 04:13:17 PM

Time (Minute)	RawData ...
0.000	0.417
1.000	0.418
2.000	0.417
3.000	0.417
4.000	0.417
5.000	0.418
6.000	0.418
7.000	0.418
8.000	0.418
9.000	0.418
10.000	0.418
11.000	0.417
12.000	0.418
13.000	0.418
14.000	0.418
15.000	0.418
16.000	0.418
17.000	0.418
18.000	0.418
19.000	0.419
20.000	0.418
21.000	0.419
22.000	0.419
23.000	0.418
24.000	0.418
25.000	0.418
26.000	0.418
27.000	0.418
28.000	0.418
29.000	0.418
30.000	0.418

3. Linieritas.

   Penimbangan myrisetin :

   Kertas kosong : 0,2812 g

   Kertas kosong + isi : 0,2921 g

   Kertas sisa : 0,2821 g

   Zat aktif : 0,0100 g

   Membuat larutan induk sebesar 100 ppm dengan menimbang 10,6 mg myrisetin ditambahkan etanol p.a sampai 100 mL, selanjutnya dibuat seri konsentrasi :

   1) 4,4 ppm

      C1 x V1 = C2 x V2

      100 ppm x V1 = 4,4 ppm x 10 mL

      V1 = 0,44 mL

   2) 6,5 ppm

      C1 x V1 = C2 x V2

      100 ppm x V1 = 6,5 ppm x 10 mL

      V1 = 0,65 mL

   3) 8,6 ppm

      C1 x V1 = C2 x V2

      100 ppm x V1 = 8,6 ppm x 10 mL

      V1 = 0,86 mL

   4) 10,6 ppm

      C1 x V1 = C2 x V2

      100 ppm x V1 = 10,6 ppm x 10 mL

      V1 = 1,06 mL

   5) 12,4 ppm

      C1 x V1 = C2 x V2

      100 ppm x V1 = 12,4 ppm x 10 mL

      V1 = 1,24 mL

Konsentrasi standar (ppm)	Absorbansi
4,4	0,355
6,5	0,465
8,6	O,580
10,6	0,682
12,4	0,793

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

a = 0,1131

b = 0,0543

r = 0,9996

y = 0,1131 + 0,0543x

keterangan:

x = konsentrasi (ppm)

y = serapan

4. Akurasi

KONSENTRASI	REPLIKASI	ABS	KONSENTRASI	ppm sebenarnya	%	RATA-RATA	RECOVERY
	1	0,460	6,3836	6,5	98%		
	2	0,461	6,4020	6,5	98%	98,21%	
80%	3	0,459	6,3652	6,5	98%		
	1	0,580	8,5920	8,6	100%		
	2	0,581	8,6104	8,6	100%	99,98%	99,76%
100%	3	0,58	8,5920	8,6	100%		
	1	0,695	10,7084	10,6	101%		
	2	0,696	10,7268	10,6	101%	101,08%	
120%	3	0,695	10,7084	10,6	101%		

$$\%\ recovery \frac{konsentrasi\ terukur}{konsentrasi\ sebenarnya} \times 100\%$$

Hasil dari akurasi didapatkan rata-rata % recovery yaitu 98,21%, 99,98% dan 101,08%. Rata-rata % yaitu 99,76%.

5. Presisi

KONSENTRASI (PPM)	ABS	KONSENTRASI
4,4	0,382	4,9481
4,4	0,383	4,9665
4,4	0,349	4,3408
4,4	0,375	4,8193
4,4	0,352	4,3960
4,4	0,352	4,3960
4,4	0,378	4,8745
4,4	0,345	4,2672
4,4	0,368	4,6905
4,4	0,38	4,9113
	RATA-RATA	0,280476
	SD	4,6610
	CV	0,060175

$$SD = \sqrt{\frac{\Sigma(x - \bar{x})^2}{n - 1}}$$

$$CV = \frac{SD}{X}$$

Hasil presisi didapatkan nilai SD sebesar 0,2804 dan nilai CVnya 0,06%.

Lampiran 5. Uji organoleptis sediaan serum.

Formula 1

Formula 2

Formulasi 3

Lampiran 6. Data pengujian pH serum myrisetin.

Formula	Replikasi	Hari ke-1	Hari ke-7	Hari ke-14	Hari ke-21
1	1	5.96	5.97	6.03	6.1
		5.96	5.98	6.06	6.12
		5.99	5.97	6.02	6.1
	Rata-rata	5.97	5.97	6.04	6.11
	SD	0.02	0.01	0.02	0.01
2	2	6.16	6.03	6.23	6.25
		6.14	6.07	6.2	6.22
		6.17	6.09	6.26	6.24
	Rata-rata	6.16	6.06	6.23	6.24
	SD	0.02	0.03	0.03	0.02
3	3	6.24	6.36	6.32	6.33
		6.27	6.31	6.28	6.33
		6.29	6.22	6.24	6.35
	Rata-rata	6.27	6.30	6.28	6.34
	SD	0.03	0.07	0.04	0.01

Lampiran 7. Data analisis *One Way* ANOVA pengujian pH.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Hari	36	2.5000	1.13389	1.00	4.00
Formula	36	2.0000	.82808	1.00	3.00
pH	36	6.1628	.12821	5.96	6.36

One-Sample Kolmogorov-Smirnov Test

		Hari	Formula	pH
N		36	36	36
Normal Parameters[a,b]	Mean	2.5000	2.0000	6.1628
	Std. Deviation	1.13389	.82808	.12821
Most Extreme Differences	Absolute	.170	.220	.145
	Positive	.170	.220	.100
	Negative	-.170	-.220	-.145
Kolmogorov-Smirnov Z		1.022	1.318	.867
Asymp. Sig. (2-tailed)		.247	.062	.440

a. Test distribution is Normal.

b. Calculated from data.

ANOVA

pH

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.450	2	.225	59.060	.000
Within Groups	.126	33	.004		
Total	.575	35			

Test of Homogeneity of Variances

pH

Levene Statistic	df1	df2	Sig.
1.683	2	33	.201

Lampiran 8. Data pengujian viskositas serum myrisetin.

Formula	Replikasi	Hari ke-1	Hari ke-7	Hari ke-14	Hari ke-21
1	1	1250	1150	950	650
		1200	1000	900	600
		1200	1100	900	600
	Rata-rata	1217	1083	917	617
	SD	29	76	29	29
2	2	1200	1100	900	550
		1250	1150	950	600
		1200	1150	950	600
	Rata-rata	1217	1133	933	583
	SD	29	29	29	29
3	3	1000	850	700	550
		1000	800	650	600
		1000	850	750	550
	Rata-rata	1000	833	700	567
	SD	0	29	50	29

Lampiran 9. Data analisis *One Way* ANOVA pengujian Viskositas

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Hari	36	2.5000	1.13389	1.00	4.00
Formula	36	2.0000	.82808	1.00	3.00
Viskositas	36	895.8333	234.63497	550.00	1250.00

One-Sample Kolmogorov-Smirnov Test

		Hari	Formula	Viskositas
N		36	36	36
Normal Parameters[a,b]	Mean	2.5000	2.0000	895.8333
	Std. Deviation	1.13389	.82808	234.63497
Most Extreme Differences	Absolute	.170	.220	.131
	Positive	.170	.220	.131
	Negative	-.170	-.220	-.111
Kolmogorov-Smirnov Z		1.022	1.318	.788
Asymp. Sig. (2-tailed)		.247	.062	.563

a. Test distribution is Normal.

b. Calculated from data.

Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
.843	2	33	.439

ANOVA

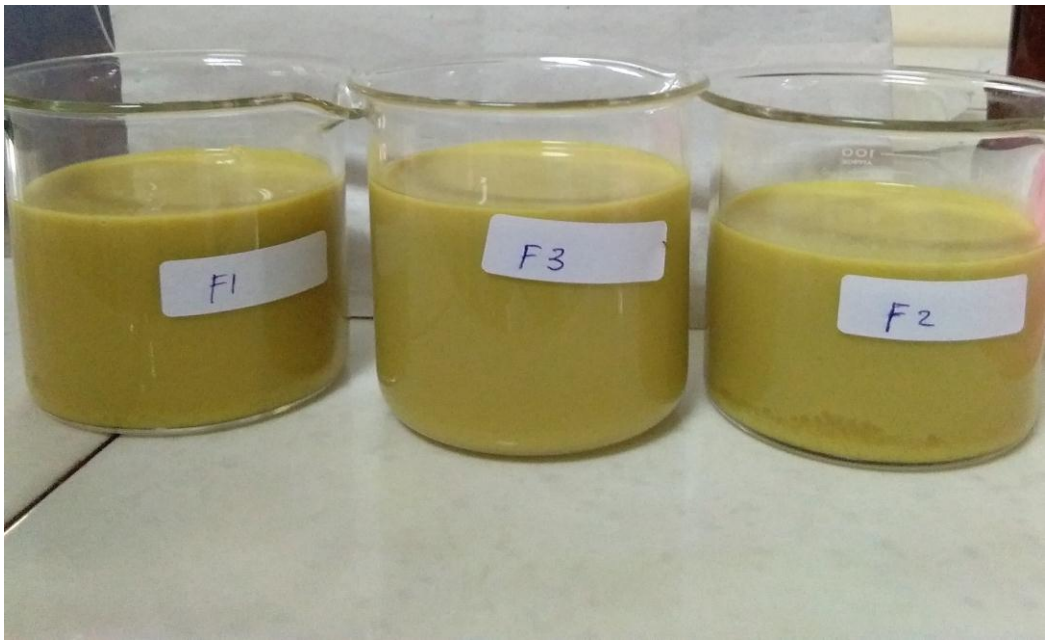
Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	282916.667	2	141458.333	2.840	.073
Within Groups	1643958.333	33	49816.919		
Total	1926875.000	35			

Lampiran 10. Data hasil pengujian stabilitas serum myrisetin.

Formula	Siklus	Pada suhu dingin			Pada suhu panas		
		Konsistensi	**Warna**	**Bau**	**Bentuk**	**Konsistensi**	**Bau**
1	**1**	sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
2		sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
3		sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
1	**2**	sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
2		sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
3		sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
1	**3**	sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
2		sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
3		sedikit kental	Kuning kecoklatan	Khas myrisetin	sedikit kental	Kuning kecoklatan	Khas myrisetin
1	**4**	sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
2		sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
3		sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
1	**5**	sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
2		sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
3		sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
1	**6**	sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
2		sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin
3		sedikit kental	Kuning gelap	Khas myrisetin	sedikit kental	Kuning gelap	Khas myrisetin

Lampiran 11. Hasil uji stabilitas serum myrisetin secara fisik.



Gambar sebelum uji stabilitas fisik serum myrisetin.

Gambar sesudah uji stabilitas secara fisik sediaan serum myrisetin.