BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Hasil penelitian menunjukkan bahwa tablet dengan campuran amilum pregelatinasi biji nangka mempunyai kemampuan yang bagus sebagai bahan penghancur tablet ibuprofen dan mempunyai sifat fisik dengan waktu alir, kekerasan, kerapuhan, waktu hancur yang sesuai dengan persyaratan yang dipersyaratkan. Profil disolusi tablet sudah memenuhi persyaratan yang disyaratkan dalam Farmakope Indonesia yaitu minimal 70% zat terlarut dalam uji disolusi selama 30 menit.

B. Saran

1. Perlu dilakukan penelitian lebih lanjut amilum biji nangka pregelatinasi sebagai bahan tambahan yang juga berfungsi sebagai penghancur dan pengikat.
2. Perlu dilakukan penelitian lebih lanjut dengan modifikasi pregelatinasi dengan menggunakan bahan amilum yang lain.

DAFTAR PUSTAKA

Akbar FA, Sugiyartono, Setiawan D. 2012. Pengaruh Penambahan Manitol Terhadap Pelepasan Ranitidin Hcl Dari Tablet Floating Dengan HPMC K100M Sebagai Matriks. *Jurnal Pharma Scientia* Volume 1 (1).

Ansel HC. 1989. *Introduction of Pharmaceutical Dosage Forms and Delivery System.* Diterjemahkan Ibrahim. Edisi IV. Universitas Indonesia. Jakarta. hlm 255.

Augsburger LL. 1994. *Principles and Practice of Direct Compression Tbaleting.* Direct Compression Technology. Jakarta. hlm 20.

Backer CA Van der Brink RC. 1963. *Flora of Java.* Volume I. Noordhoff. Groeningen. hlm 90.

Banker and Anderson. 1986. *The Theory and Practice of Industrial Pharmacy.* Diterjemahkan Siti Suyatmi. Edis 3. Universitas Indonesia. Jakarta. hlm 176-178.

Boylan JJ, Cooper J, Chowhan ZT. 1986. *Handbook og Fharmaceutical Excipients.* Washington DC. United States. hlm 30-32.

Cunningham. 2001. Starch Contrasts: knowing the Differences among Pregelatinized Starch will Produces Desired Formulation Release Rates. *The Journal Pharmacy.* hlm 44.

Departemen Kesehatan Republik Indonesia. 1979. *Farmakope Indonesia.* Edisi III. Jakarta. hlm 7.

Departemen Kesehatan Republik Indonesia. 1995. *Farmakope Indonesia.* Edisi IV. Jakarta. hlm 4-6, 112, 488, 515, 648, 711.

Departemen Kesehatan Republik Indonesia. 2000. *Informatorium Obat Nasional Indonesia.* Direktorat Jenderal Pengawas Obat dan Makanan. Jakarta. hlm 355.

Fudholi A. 1983. *Metodologi Formulasi dalam Kompresi.* Medika 7. hlm 586.

Gunsel WC and Kanig JL. 1986. *The Theory and Practice of Industrial Pharmacy.* Volume II. Lea and Febeiger. Philadelpia. hlm 107-109.

Gusmayadi I. 2002. Perbandingan Amilum Biji Nangka Dengan Amprotab Dalam Fungsinya Sebagai Penghancur Tablet. *Jurnal Bahan Alam Indonesia* ISSN 1412-2855 Volume 1 (2): 39.

Gusmayadi I, Indriani O, Widayanti, Nugraheni D. 2003. Penentuan Kadar Optimum Amilum Biji Nangka Sebagai Bahan Pelicin Tablet Secara Eksternal. *Jurnal Bahan Alam Indonesia* ISSN 1412-2855 Volume 2 (4): 125.

Heyne K. 1987. *De Nuttige Planten van Indonesie.* Diterjemahkan oleh badan Litbang Kehutanan Jakarta, Jilid II. Yayasan Sarana Wana Jaya. Jakarta. hlm 679.

Hidayat MT. 2010. *Pengaruh Kombinasi Bahan Pilicin Magnesium Stearat dan Talk (1:9) Terhadap Sifat Fisis dan Profil Disolusi Tablet Campuran Interaktif Prednison* [Skripsi]. Fakultas Farmasi, Universitas Setia Budi. Surakarta.

Indiani O. 2004. Amilum Buah Sukun Sebagai Bahan Penghancur Eksternal Dalam Pembuatan Tablet. *Jurnal Bahan Alam Indonesia* ISSN 1412-12-2855 Volume 3 (2): 181.

Kurniawan S. 2003. *Penggunaan amilum pregelatinasi sebagai bahan pengisi-pengikat tablet kempa langsung acetosal* [Skripsi]. Fakultas Farmasi, Universitas Sanata Dharma. Yogyakarta.

Lachman L, Lieberman HA. 1994. *The Theory and Practice of Industrial Pharmacy.* Diterjemahkan Suyatmi S. *Teori dan Praktek Industri Farmasi.* Edisi III. Universitas Indonesia. Jakarta. hlm 109-110, 160-161, 654-691.

Lowenthal WJJ. 1972. *Disitegration of Tablet.* Volume 61. hlm 1695-1970.

Martin A, Swarbrick J, Cammarata A. 1993. *Physical Pharmacy. Physical Chemical Principles in the Pharmaceutical Sciences.* Diterjemahkan Yoshita. Edisi III. Universitas Indonesia. Jakarta. hlm 1019-1072.

Mariyani KA. 2012. *Pengaruh Konsentrasi Amilum Jagung Pregelatinasi Sebagai Bahan Penghancur Terhadap Sifat Fisik Tablet Vitamin E Untuk Anjing* [Skripsi]. Fakultas FMIPA, Universitas Udayana. Bali.

Rohman A. 2007. *Kimia Farmasi Analisis.* Pustaka Pelajar. Yogyakarta. hlm 406.

Shargel L, and Andrew BC. 2005. *Biofarmasetika dan Farmakoterapi Terapan.* Edisi kedua. Surabaya: Airlangga University Press. Hlm 96.

Sheth BB, Bandelin FJ, Shangraw RF. 1980. *Compressed Tablets, Pharmaceutical Dosage Form: Tablets.* Volume 1. Marcel Dekker Inc. New York. hlm 109-115.

Soedibyo M. 1998. *Alam Sumber Kesehatan, Manfaat dan Kegunaan.* 271-272. Balai Pustaka. Jakarta.

Sulaiman TNS. 2007. *Teknologi dan Formulasi Sediaan Tablet.* Universitas Gadjah Mada. Yogyakarta. hlm 80, 96, 108.

Syamsuni HA. 2006. *Ilmu Resep.* Jakarta. Penerbit Buku Kedokteran EGC. hlm 71.

Syamsuni HA. 2007. *Ilmu Resep*. Cetakan I. Jakarta. EGC. hlm 263-264.

Tjay TH dan Rahardja K. 2007. *Obat-Obat Penting.* Elex Media Computindo. Jakarta. hlm 333.

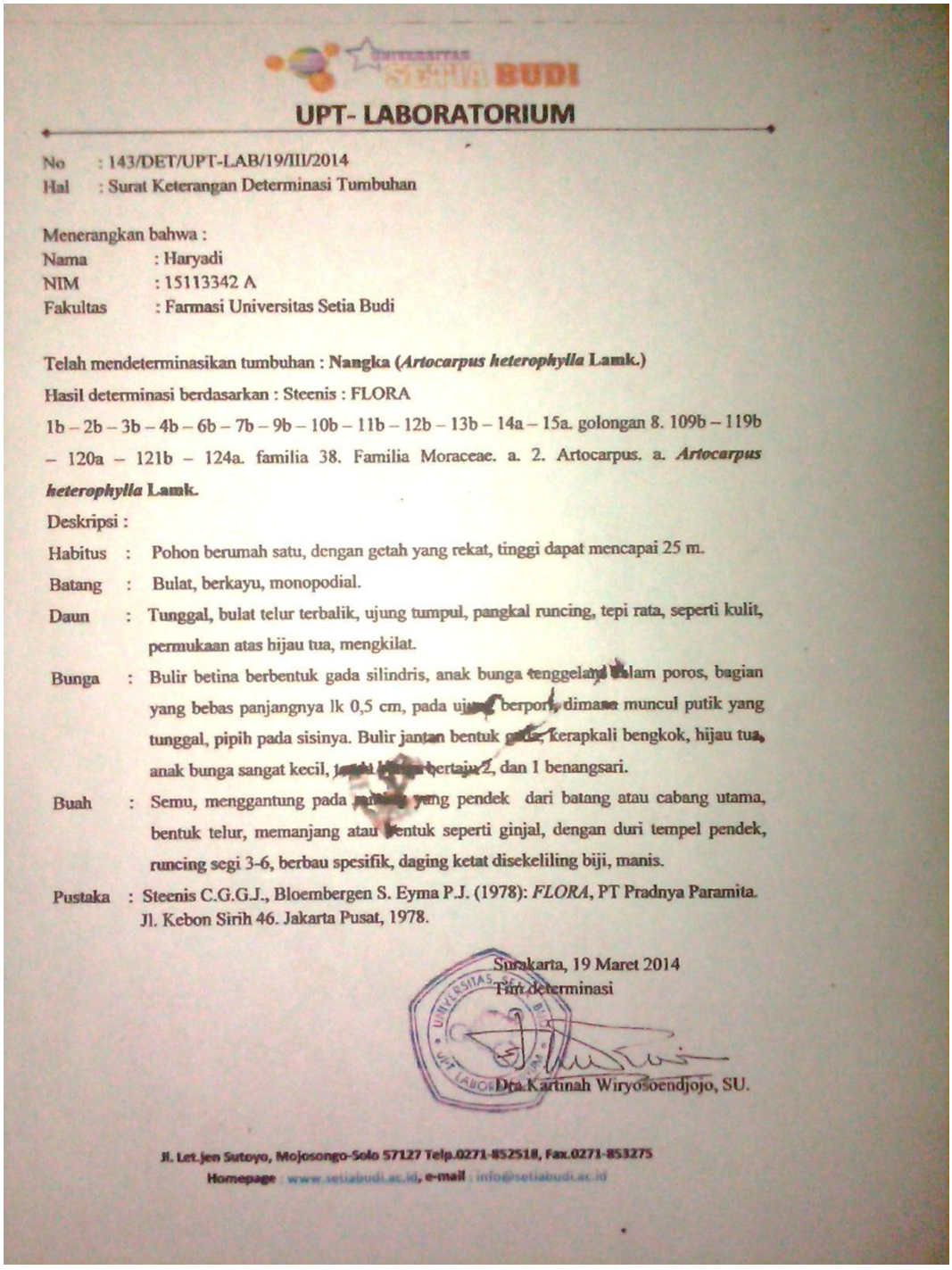
Tyler, Lynn EL, Brady, James E, Robber. 1988. *Pharmacognosy.* Volume 9. Lea and Febriger. Philadelphia. hlm 41-43.

Voigt. 1995. *Buku Pelajaran Teknologi Farmasi.* Edisi 5. Universitas Gadjah Mada. Yogyakarta. hlm 171-175, 201-203, 220-226.

Wallis. TE. 1967. *Textbook of Pharmacognosy.* London J and Churchill Ltd. hlm 7-20.

Zobel FH. 1984. *Gelatination of Starch and Mechanical Properties of Starch pastes, Starch: Chemistry and Technology.* Edisi 2. Orlando san diego. New York. hlm 294.

Lampiran 1 : Determinasi tanaman nangka



UNIVERSITAS SETIA BUDI

UPT- LABORATORIUM

No : 143/DET/UPT-LAB/19/III/2014
Hal : Surat Keterangan Determinasi Tumbuhan

Menerangkan bahwa :
Nama : Haryadi
NIM : 15113342 A
Fakultas : Farmasi Universitas Setia Budi

Telah mendeterminasikan tumbuhan : **Nangka (*Artocarpus heterophylla* Lamk.)**

Hasil determinasi berdasarkan : Steenis : FLORA

1b – 2b – 3b – 4b – 6b – 7b – 9b – 10b – 11b – 12b – 13b – 14a – 15a. golongan 8. 109b – 119b – 120a – 121b – 124a. familia 38. Familia Moraceae. a. 2. Artocarpus. a. ***Artocarpus heterophylla* Lamk.**

Deskripsi :

Habitus : Pohon berumah satu, dengan getah yang rekat, tinggi dapat mencapai 25 m.

Batang : Bulat, berkayu, monopodial.

Daun : Tunggal, bulat telur terbalik, ujung tumpul, pangkal runcing, tepi rata, seperti kulit, permukaan atas hijau tua, mengkilat.

Bunga : Bulir betina berbentuk gada silindris, anak bunga tenggelam dalam poros, bagian yang bebas panjangnya lk 0,5 cm, pada ujung berpori, dimana muncul putik yang tunggal, pipih pada sisinya. Bulir jantan bentuk gada, kerapkali bengkok, hijau tua, anak bunga sangat kecil, [illegible] bertaju 2, dan 1 benangsari.

Buah : Semu, menggantung pada [illegible] yang pendek dari batang atau cabang utama, bentuk telur, memanjang atau bentuk seperti ginjal, dengan duri tempel pendek, runcing segi 3-6, berbau spesifik, daging ketat disekeliling biji, manis.

Pustaka : Steenis C.G.G.J., Bloembergen S. Eyma P.J. (1978): *FLORA*, PT Pradnya Paramita. Jl. Kebon Sirih 46. Jakarta Pusat, 1978.

Surakarta, 19 Maret 2014
Tim determinasi

Dra. Kartinah Wiryosoendjojo, SU.

Jl. Let.jen Sutoyo, Mojosongo-Solo 57127 Telp.0271-852518, Fax.0271-853275
Homepage : www.setiabudi.ac.id, e-mail : info@setiabudi.ac.id

Lampiran 2. Keseragaman bobot tablet

No	% penyimpangan bobot tablet							
	F1		F2		F3		F4	
	mg	%	mg	%	Mg	%	mg	%
1	492	0.19	479.8	1.43	486.8	0.30	488.9	0.54
2	495	0.80	487.5	0.15	475.5	2.03	488.6	0.48
3	492	0.19	486.9	0.03	487.8	0.50	487.6	0.27
4	490	0.21	485.5	0.26	478.9	1.33	478.6	1.58
5	479	2.45	490.5	0.77	486.7	0.28	480.8	1.13
6	495	0.80	487.5	0.15	488.3	0.61	485.3	0.20
7	499	1.62	487.5	0.15	486.5	0.23	485.4	0.18
8	493	0.40	487.9	0.24	488.5	0.65	487.6	0.27
9	496	1.01	480.5	1.28	488.5	0.65	480.6	1.17
10	497	1.21	487.6	0.17	480.5	1.00	487.6	0.27
11	489	0.42	488.5	0.36	478.5	1.41	490.5	0.87
12	491	0.01	487.6	0.17	478.5	1.41	485.3	0.20
13	485	1.23	490.5	0.77	486.8	0.30	490.8	0.93
14	486	1.03	485.3	0.30	490.1	0.98	487.5	0.25
15	492	0.19	490.2	0.71	487.5	0.44	486.8	0.11
16	487	0.82	490.5	0.77	488.5	0.65	488.2	0.39
17	487	0.82	490.8	0.83	488.2	0.59	485.5	0.16
18	495	0.80	486.7	0.01	485.5	0.03	487.5	0.25
19	488	0.62	486	0.15	487	0.34	485	0.26
20	493	0.40	478.6	1.67	488.6	0.67	489.8	0.72
∑	9821		9735.9		9707.2		9727.9	
X±SD	491.05±4.78		486.75±3.62		485.36±4.33		486.28±3.24	
CV	0.97		0.74		0.89		0.66	

Persentase (%) penyimpangan bobot tablet

$$\frac{\text{Bobot rata-rata tablet} - \text{Bobot tablet}}{\text{Bobot rata-rata tablet}} \text{ X } 100\%$$

$$\text{CV} = \frac{\text{SD}}{\text{Rata-rata tablet}} x100\%$$

Lampiran 3. Pembuatan larutan baku/stok ibuprofen 50 ppm

25 mg ----- 500 ml

50 mg ----- 1000 ml = 50 ppm

Ambil 25 mg ibuprofen larutkan dengan larutan dapar fosfat pH 7.2 ad 500 ml.

Buat larutan dengan konsentrasi 10 ppm sebanyak 50 ml dengan memakai larutan baku 50 ppm.

10 ppm : V1.N1 = V2.N2

V1.50 ppm = 50 ml.10 ppm

V1 = 10 ml

Ambil 10 ml larutan dari larutan baku stok tambahkan dapar fosfat ad 50 ml, cari panjang gelombang maksimal ibuprofen dan buat larutan ibuprofen dengan kadar 4 ppm, 6 ppm, 8 ppm, 10 ppm, 12 ppm, 14ppm, 16 ppm, 18 ppm, masing-masing sebanyak 10 ml.

Rumus pengenceran

V1.N1 = V2.N2

4 ppm : V1.N1 = V2.N2
V1.50 = 10.4
V1 = 0.8 ml

6 ppm : V1.N1 = V2.N2
V1.50 = 10.6
V1 = 1.2 ml

8 ppm : V1.N1 = V2.N2
V1.50 = 10.8
V1 = 1.6 ml

10 ppm : V1.N1 = V2.N2
V1.50 = 10.10
V1 = 2 ml

12 ppm :V1.N1 = V2.N2
V1.50 = 10.12
V1 = 2.4 ml

14 ppm : V1.N1 = V2.N2
V1.50 = 10.14
V1 = 2.8 ml

16 ppm : V1.N1 = V2.N2
V1.50 = 10.16
V1 = 3.2 ml

18 ppm : V1.N1 = V2.N2
V1.50 = 10.18
V1 = 3.6 ml

Kurva baku Ibuprofen

Konsentrasi (mg/l)	Absorbansi
4	0.270
6	0.366
8	0.425
10	0.524
12	0.587
14	0.645
16	0.724
18	0.827

a = 0.1261

b = 0.0381

r = 0.9978

Persamaan : Y = a+bx

Lampiran 4. Perhitungan uji keseragaman kandungan zat aktif

% kadar : kadar/dosis per tablet X 100%

10 tablet satu persatu ditimbang, gerus tablet campur dengan dapar posfat sampai 50 ml, ambil 0.5 ml tambah dapar sampai 10 ml (20 kali pengenceran), ambil lagi 1 ml dari 10 ml tambahkan dapar 25 ml (25 kali pengenceran). Baca absorbansinya dengan panjang gelombang 221 nm.

Contoh :

Formula 1

Y=0.427

0.427 = 0.1261+0.0381x

= 0.427 – 0.1261/0.0381

= 7.90 ppm

Kadar = 7.90 mg/1000 ml . 50 ml . 20 . 25 = 197.5 mg

% kadar = 197.5 mg/200 mg . 100% = 98.75%

Formula 2

Y=0.435

0.435 = 0.1261+0.0381x

= 0.435 – 0.1261/0.0381

= 8.10 ppm

Kadar = 8.10 mg/1000 ml . 50 ml . 20 . 25 = 202.69 mg

% kadar = 202.69 mg/200 mg . 100% = 101.34%

Formula 3

Y=0.431

0.431 = 0.1261+0.0381x

= 0.431 – 0.1261/0.0381

= 8.002 ppm

Kadar = 8.002 mg/1000 ml . 50 ml . 20 . 25 = 200.06 mg

% kadar = 200.06 mg/200 mg . 100% = 100.03%

Formula 4

Y=0.437

0.437 = 0.1261+0.0381x

= 0.437 – 0.1261/0.0381

= 8.16 ppm

Kadar = 8.16 mg/1000 ml . 50 ml . 20 . 25 = 204 mg

% kadar = 204 mg/200 mg . 100% = 102%

No.	Formula 1			Formula 2			Formula 3			Formula 4		
	Bobot (mg)	Abs	% kadar	Bobot (mg)	Abs	% kadar	Bobot (mg)	Abs	% kadar	Bobot (mg)	Abs	% kadar
1	490.5	0.427	98.75	490.1	0.435	101.34	485.1	0.431	100.03	490.1	0.437	102
2	485.9	0.430	99.7	487	0.387	88.87	490	0.426	98.39	492.1	0.425	98.06
3	491	0.426	98.39	486.2	0.421	96.75	487.6	0.418	95.76	492.5	0.416	95.11
4	493.2	0.432	100.36	492.3	0.431	100.03	488	0.415	94.78	489.5	0.429	99.37
5	488.1	0.431	100.03	485.6	0.418	95.76	489.5	0.426	98.39	488.8	0.397	88.87
6	488	0.425	98.06	491.2	0.425	98.06	485	0.425	98.06	489.5	0.408	92.48
7	486.3	0.423	97.40	486	0.411	93.47	492	0.412	93.79	487.3	0.414	94.45
8	489.8	0.438	102.32	492	0.429	99.37	490.3	0.416	95.11	489	0.426	98.39
9	485.5	0.420	96.42	495.5	0.427	98.72	486.4	0.417	95.43	488.2	0.409	92.81
10	479.8	0.390	86.90	485	0.419	96.09	488.1	0.410	93.14	488	0.410	93.14
SD			4.18	SD		3.62	SD		2.28	SD		3.93

Lampiran 5. Rumus dan perhitungan kadar serta persentase (%) kadar ibuprofen

Kadar : x.fp.p

% kadar : kadar/dosis per tablet X 100%

Keterangan :

Y : absorbansi

x : konsentrasi (ppm)

fp : factor pembuatan (900 ml)

p : pengenceran

Ambil 1 ml dari larutan sampel 10 ml, tambah dengan larutan dapar pH 7.2 sampai 10 ml dengan labu takar (10 kali pengenceran). Absorbansinya dibaca dengan panjang gelombang 221 nm.

Contoh perhitungan:

Formula 1

Menit ke 2 : 0.352 = 0.1261 + 0.0381x

x = 0.352 – 0.1261 / 0.0381

x = 5.92 ppm

kadar : 5.92 mg/1000 ml . 900 ml . 10 = 53.36 mg

% kadar : 53.36 mg / 201.3 mg x 100% = 26.51%

Menit ke 4: 0.565 = 0.1261 + 0.0381x

x = 0.565 – 0.1261 / 0.0381

x = 11.51 ppm

kadar : 11.51 mg/1000 ml . 900 ml . 10 = 103.67 mg

% kadar : 103.67 mg / 201.3 mg x 100% = 51.50%

Menit ke 6 : 0.633 = 0.1261 + 0.0381x

x = 0.633 – 0.1261 / 0.0381

x = 13.30 ppm

kadar : 13.30 mg/1000 ml . 900 ml . 10 = 119.74 mg

% kadar : 119.74 mg / 201.3 mg x 100% = 59.48%

Menit ke 8 : 0.725 = 0.1261 + 0.0381x

x = 0.725 – 0.1261 / 0.0381

x = 15.71 ppm

kadar : 15.71 mg/1000 ml . 900 ml . 10 = 141.47 mg

% kadar : 141.47 mg / 201.3 mg x 100% = 70.27%

Menit ke 10 : 0.824 = 0.1261 + 0.0381x

x = 0.824 – 0.1261 / 0.0381

x = 18.31 ppm

kadar : 18.31 mg/1000 ml . 900 ml . 10 = 164.85 mg

% kadar : 164.85 mg / 201.3 mg x 100% = 81.89%

Menit ke 20 : 0.547 = 0.1261 + 0.0381x

x = 0.547 – 0.1261 / 0.0381

x = 11.04 ppm

kadar : 11.04 mg/1000 ml . 900 ml . 20 = 198.85 mg

% kadar : 198.85 mg / 201.3 mg x 100% = 98.78%

Menit ke 30 : 0.554 = 0.1261 + 0.0381x

x = 0.554 – 0.1261 / 0.0381

x = 11.23 ppm

kadar : 11.23 mg/1000 ml . 900 ml . 20 = 202.15 mg

% kadar : 202.15 mg / 201.3 mg x 100% = 100.42%

Pada formula 1 menit 20 dan ke 30, sampel diambil 0.5 ml tambahkan larutan dapar posfat pH 7.2 (20 kali pengenceran).

Formula 2

Menit ke 2 : 0.405 = 0.1261 + 0.0381x

x = 0.405 – 0.1261 / 0.0381

x = 7.32 ppm

kadar : 7.32 mg/1000 ml . 900 ml . 10 = 65.88 mg

% kadar : 65.88 mg / 200.5 mg x 100% = 32.85%

Menit ke 4: 0.427 = 0.1261 + 0.0381x

x = 0.427 – 0.1261 / 0.0381

x = 7.90 ppm

kadar : 7.90 mg/1000 ml . 900 ml . 10 = 71.07 mg

% kadar : 71.07 mg / 200.5 mg x 100% = 35.44%

Menit ke 6 : 0.478 = 0.1261 + 0.0381x

x = 0.478 – 0.1261 / 0.0381

x = 9.23 ppm

kadar : 9.23 mg/1000 ml . 900 ml . 10 = 83.12 mg

% kadar : 83.12 mg / 200.5 mg x 100% = 41.45%

Menit ke 8 : 0.562 = 0.1261 + 0.0381x

x = 0.562 – 0.1261 / 0.0381

x = 11.44 ppm

kadar : 11.44 mg/1000 ml . 900 ml . 10 = 102.96 mg

% kadar : 102.96 mg / 200.5 mg x 100% = 51.35%

Menit ke 10 : 0.616 = 0.1261 + 0.0381x

x = 0.616 – 0.1261 / 0.0381

x = 12.85 ppm

kadar : 12.85 mg/1000 ml . 900 ml . 10 = 115.72 mg

% kadar : 115.72 mg / 200.5 mg x 100% = 57.71%

Menit ke 20 : 0.761 = 0.1261 + 0.0381x

x = 0.761 – 0.1261 / 0.0381

x = 16.66 ppm

kadar : 16.66 mg/1000 ml . 900 ml . 10 = 149.97 mg

% kadar : 149.97 mg / 200.5 mg x 100% = 74.79%

Menit ke 30 : 0.830 = 0.1261 + 0.0381x

x = 0.830 – 0.1261 / 0.0381

x = 18.47 ppm

kadar : 18.47 mg/1000 ml . 900 ml . 10 = 166.23 mg

% kadar : 166.23 mg / 200.5 mg x 100% = 82.90%

Formula 3

Menit ke 2 : 0.420 = 0.1261 + 0.0381x

x = 0.420 – 0.1261 / 0.0381

x = 7.71 ppm

kadar : 7.71 mg/1000 ml . 900 ml . 10 = 69.42 mg

% kadar : 69.42 mg / 200.7 mg x 100% = 34.58%

Menit ke 4: 0.436 = 0.1261 + 0.0381x

x = 0.436 – 0.1261 / 0.0381

x = 8.13 ppm

kadar : 8.13 mg/1000 ml . 900 ml . 10 = 74.20 mg

% kadar : 74.20 mg / 200.7 mg x 100% = 36.97%

Menit ke 6 : 0.4695 = 0.1261 + 0.0381x

x = 0.4695 – 0.1261 / 0.0381

x = 9.01 ppm

kadar : 9.01 mg/1000 ml . 900 ml . 10 = 81.11 mg

% kadar : 81.11 mg / 200.7 mg x 100% = 40.41%

Menit ke 8 : 0.487 = 0.1261 + 0.0381x

x = 0.487 – 0.1261 / 0.0381

x = 9.47 ppm

kadar : 9.47 mg/1000 ml . 900 ml . 10 = 85.25 mg

% kadar : 85.25 mg / 200.7 mg x 100% = 42.47%

Menit ke 10 : 0.522 = 0.1261 + 0.0381x

x = 0.522 – 0.1261 / 0.0381

x = 10.40 ppm

kadar : 10.40 mg/1000 ml . 900 ml . 10 = 93.51 mg

% kadar : 93.51 mg / 200.7 mg x 100% = 46.59%

Menit ke 20 : 0.736 = 0.1261 + 0.0381x

x = 0.736 – 0.1261 / 0.0381

x = 16.01 ppm

kadar : 16.01 mg/1000 ml . 900 ml . 10 = 144.07 mg

% kadar : 144.07 mg / 200.7 mg x 100% = 71.78%

Menit ke 30 : 0.820 = 0.1261 + 0.0381x

x = 0.820 – 0.1261 / 0.0381

x = 18.21 ppm

kadar : 18.21 mg/1000 ml . 900 ml . 10 = 163.91 mg

% kadar : 163.91 mg / 200.7 mg x 100% = 81.66%

Formula 4

Menit ke 2 : 0.453 = 0.1261 + 0.0381x

x = 0.453 – 0.1261 / 0.0381

x = 8.58 ppm

kadar : 8.58 mg/1000 ml . 900 ml . 10 = 77.22 mg

% kadar : 77.22 mg / 201.5 mg x 100% = 38.32%

Menit ke 4: 0.466 = 0.1261 + 0.0381x

x = 0.466 – 0.1261 / 0.0381

x = 8.91 ppm

kadar : 8.91 mg/1000 ml . 900 ml . 10 = 80.29 mg

% kadar : 80.29 mg / 201.5 mg x 100% = 39.84%

Menit ke 6 : 0.474 = 0.1261 + 0.0381x

x = 0.474 – 0.1261 / 0.0381

x = 9.13 ppm

kadar : 9.13 mg/1000 ml . 900 ml . 10 = 82.18 mg

% kadar : 82.18 mg / 201.5 mg x 100% = 40.78%

Menit ke 8 : 0.492 = 0.1261 + 0.0381x

x = 0492 – 0.1261 / 0.0381

x = 9.60 ppm

kadar : 9.60 mg/1000 ml . 900 ml . 10 = 86.43 mg

% kadar : 86.43 mg / 201.5 mg x 100% = 42.89%

Menit ke 10 : 0.592 = 0.1261 + 0.0381x

x = 0.592 – 0.1261 / 0.0381

x = 12.22 ppm

kadar : 12.22 mg/1000 ml . 900 ml . 10 = 110.05 mg

% kadar : 110.05 mg / 201.5 mg x 100% = 54.61%

Menit ke 20 : 0.714 = 0.1261 + 0.0381x

x = 0.714 – 0.1261 / 0.0381

x = 15.43 ppm

kadar : 15.43 mg/1000 ml . 900 ml . 10 = 138.87 mg

% kadar : 138.87 mg / 201.5 mg x 100% = 68.91%

Menit ke 30 : 0.862 = 0.1261 + 0.0381x

x = 0.862 – 0.1261 / 0.0381

x = 19.31 ppm

kadar : 19.31 mg/1000 ml . 900 ml . 10 = 173.83 mg

% kadar : 173.83 mg / 201.5 mg x 100% = 86.26%

Lampiran 6. Hasil disolusi tablet ibuprofen

F1	Menit	Absorbansi	Kadar (mg/l)	Faktor pembuatan	Faktor pengenceran	Dosis per tablet	Kadar (mg)	% Kadar
	2	0.352	5.92	900	10	201.3	53.36	26.51
	4	0.565	11.51	900	10	201.3	103.67	51.50
	6	0.633	13.30	900	10	201.3	119.74	59.48
	8	0.725	15.71	900	10	201.3	141.47	70.27
	10	0.824	18.31	900	10	201.3	164.85	81.89
	20	0.547	11.04	900	20	201.3	198.85	98.78
	30	0.554	11.23	900	20	201.3	202.15	100.42

F2	Menit	Absorbansi	Kadar (mg/l)	Faktor pembuatan	Faktor pengenceran	Dosis per tablet	Kadar (mg)	% Kadar
	2	0.405	7.32	900	10	200.5	65.88	32.85
	4	0.427	7.90	900	10	200.5	71.07	35.44
	6	0.478	9.23	900	10	200.5	83.12	41.45
	8	0.562	11.44	900	10	200.5	102.96	51.35
	10	0.616	12.85	900	10	200.5	115.72	57.71
	20	0.761	16.66	900	10	200.5	149.97	74.79
	30	0.830	18.47	900	10	200.5	166.23	82.90

F3	Menit	Absorbansi	Kadar (mg/l)	Faktor pembuatan	Faktor pengenceran	Dosis per tablet	Kadar (mg)	% Kadar
	2	0.420	7.71	900	10	200.7	69.42	34.58
	4	0.436	8.13	900	10	200.7	74.20	36.97

6	0.4695	9.01	900	10	200.7	81.11	40.41
8	0.487	9.47	900	10	200.7	85.25	42.47
10	0.522	10.40	900	10	200.7	93.51	46.59
20	0.736	16.01	900	10	200.7	144.07	71.78
30	0.820	18.21	900	10	200.7	163.91	81.66

F4	Menit	Absorbansi	Kadar (mg/l)	Faktor pembuatan	Faktor pengenceran	Dosis per tablet	Kadar (mg)	% Kadar
	2	0.453	38.58	900	10	201.5	77.24	38.32
	4	0.466	8.91	900	10	201.5	80.29	39.84
	6	0.474	9.13	900	10	201.5	82.18	40.78
	8	0.492	9.60	900	10	201.5	86.43	42.89
	10	0.592	12.22	900	10	201.5	110.05	54.61
	20	0.714	15.43	900	10	201.5	138.87	68.91
	30	0.862	19.31	900	10	201.5	173.83	86.26

Lampiran 7. Hasil uji *dissolution efficiency* (DE)

Formula 1

$AUC^{2-0} = \frac{(0+53.36).(2-0)}{2}$ = 53.36 mg. menit

$AUC^{4-2} = \frac{(103.67+53.36).(4-2)}{2}$ = 157.02 mg. menit

$AUC^{6-4} = \frac{(119.74+103.67).(6-4)}{2}$ = 223.41 mg. menit

$AUC^{8-6} = \frac{(141.47+119.75).(8-6)}{2}$ = 261.22 mg. menit

$AUC^{10-8} = \frac{(164.85+141.47).(10-8)}{2}$ = 306.32 mg. menit

$AUC^{20-10} = \frac{(198.85+164.85).(20-10)}{2}$ = 1818,5 mg. menit

$AUC^{30-20} = \frac{(202.15+198.85).(30-20)}{2}$ = 2005 mg. menit

AUCtotal = 53.36 + 157.02 + 223.41 + 261.22 + 306.32 + 1818.5 + 2005

= 4824.83 mg. Menit

DE30 = $\frac{4824.83 \text{ mg.Menit}}{201.3\ mg\ x\ 30\ menit}$ x 100%

= 79.89 %

Formula 2

$AUC^{2-0} = \frac{(0+65.88).(2-0)}{2}$ = 65.88 mg. menit

$AUC^{4-2} = \frac{(71.07+65.88).(4-2)}{2}$ = 136.95 mg. menit

$AUC^{6-4} = \frac{(83.12+71.07).(6-4)}{2}$ = 154.19 mg. menit

$AUC^{8-6} = \frac{(102.96+83.12).(8-6)}{2}$ = 186.08 mg. menit

$AUC^{10-8} = \frac{(115.72+102.96).(10-8)}{2}$ = 218.68 mg. menit

$AUC^{20\text{-}10} = \frac{(149.97+115.72).(20-10)}{2}$ = 1328.45 mg. menit

$AUC^{30\text{-}20} = \frac{(166.23+149.97).(30-20)}{2}$ = 1581 mg. menit

AUCtotal = 65.88 + 136.95 + 154.19 + 186.08 + 218.68 + 1328.45 + 1581

= 3671.23 mg. Menit

DE30 = $\frac{3671.23 \text{ mg.Menit}}{200.5\ mg\ x\ 30\ menit}$ x 100%

= 61.03 %

Formula 3

$AUC^{2\text{-}0} = \frac{(0+69.42).(2-0)}{2}$ = 69.42 mg. menit

$AUC^{4\text{-}2} = \frac{(74.20+69.42).(4-2)}{2}$ = 143.62 mg. menit

$AUC^{6\text{-}4} = \frac{(81.11+74.20).(6-4)}{2}$ = 155.31 mg. menit

$AUC^{8\text{-}6} = \frac{(85.25+81.11).(8-6)}{2}$ = 166.36 mg. menit

$AUC^{10\text{-}8} = \frac{(93.51+85.25).(10-8)}{2}$ = 178.76 mg. menit

$AUC^{20\text{-}10} = \frac{(144.07+93.51).(20-10)}{2}$ = 1187.9 mg. menit

$AUC^{30\text{-}20} = \frac{(163.91+144.07).(30-20)}{2}$ = 1539.9 mg. menit

AUCtotal = 69.42 + 143.62 + 155.31 + 166.36 + 178.76 + 1187.9 + 1539.9

= 3441.27 mg. Menit

DE30 = $\frac{3441.27 \text{ mg.Menit}}{200.7\ mg\ x\ 30\ menit}$ x 100%

= 57.15 %

Formula 4

$AUC^{2\text{-}0} = \frac{(0+77.24).(2-0)}{2}$ = 77.24 mg. menit

$AUC^{4-2} = \frac{(80.29+77.24).(4-2)}{2}$ = 157.53 mg. menit

$AUC^{6-4} = \frac{(82.18+80.29).(6-4)}{2}$ = 162.47 mg. menit

$AUC^{8-6} = \frac{(86.43+82.18).(8-6)}{2}$ = 168.61 mg. menit

$AUC^{10-8} = \frac{(110.05+86.43).(10-8)}{2}$ = 196.48 mg. menit

$AUC^{20-10} = \frac{(138.87+110.05).(20-10)}{2}$ = 1244.6 mg. menit

$AUC^{30-20} = \frac{(173.83+138.87).(30-20)}{2}$ = 1563.5 mg. menit

AUCtotal = 77.24 + 157.53 + 162.47 + 168.61 + 196.48 + 1244.6 + 1563.5

= 3570.43 mg. Menit

DE30 = $\frac{3570.43 \text{ mg.Menit}}{201.5\ mg\ x\ 30\ menit}$ x 100%

= 59.06 %

Lampiran 8. Hasil uji statistics dengan *SPSS*

Keseragaman bobot

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Kesergmnbbt	80	487.400	4.5082	475.5	499.0

One-Sample Kolmogorov-Smirnov Test

		Kesergmnbbt
N		80
Normal Parameters[a,,b]	Mean	487.400
	Std. Deviation	4.5082
Most Extreme Differences	Absolute	.147
	Positive	.095
	Negative	-.147
Kolmogorov-Smirnov Z		1.317
Asymp. Sig. (2-tailed)		.062

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Test of Homogeneity of Variances

Kesergmnbbt

Levene Statistic	df1	df2	Sig.
1.447	3	76	.236

ANOVA

Kesergmnbbt

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	377.203	3	125.734	7.779	.000
Within Groups	1228.377	76	16.163		
Total	1605.580	79			

Post Hoc Tests

Multiple Comparisons

Kesergmnbbt

Scheffe

(I) Formulasi	(J) Formulasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	4.2550*	1.2713	.015	.620	7.890
	3	5.6900*	1.2713	.000	2.055	9.325
	4	4.6550*	1.2713	.006	1.020	8.290
2	1	-4.2550*	1.2713	.015	-7.890	-.620
	3	1.4350	1.2713	.736	-2.200	5.070
	4	.4000	1.2713	.992	-3.235	4.035
3	1	-5.6900*	1.2713	.000	-9.325	-2.055
	2	-1.4350	1.2713	.736	-5.070	2.200
	4	-1.0350	1.2713	.882	-4.670	2.600
4	1	-4.6550*	1.2713	.006	-8.290	-1.020
	2	-.4000	1.2713	.992	-4.035	3.235
	3	1.0350	1.2713	.882	-2.600	4.670

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Kesergmnbbt

Scheffe[a]

Formulasi	N	Subset for alpha = 0.05	
		1	2
3	20	485.360	
4	20	486.395	
2	20	486.795	
1	20		491.050
Sig.		.736	1.000

Means for groups in homogeneous subsets are displayed.

Kesergmnbbt

Scheffe[a]

Formulasi	N	Subset for alpha = 0.05	
		1	2
3	20	485.360	
4	20	486.395	
2	20	486.795	
1	20		491.050
Sig.		.736	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 20.000.

Kekerasan

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Kekerasan	12	6.375	1.3864	4.0	7.8

One-Sample Kolmogorov-Smirnov Test

		Kekerasan
N		12
Normal Parameters[a,,b]	Mean	6.375
	Std. Deviation	1.3864
Most Extreme Differences	Absolute	.343
	Positive	.192
	Negative	-.343
Kolmogorov-Smirnov Z		1.187
Asymp. Sig. (2-tailed)		.119

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Test of Homogeneity of Variances

Kekerasan

Levene Statistic	df1	df2	Sig.
1.628	3	8	.258

ANOVA

Kekerasan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20.909	3	6.970	238.962	.000
Within Groups	.233	8	.029		
Total	21.143	11			

Post Hoc Tests

Multiple Comparisons

Kekerasan

Scheffe

(I) Formulasi	(J) Formulasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	3.3667*	.1394	.000	2.880	3.854
	3	.7333*	.1394	.006	.246	1.220
	4	.4000	.1394	.113	-.087	.887
2	1	-3.3667*	.1394	.000	-3.854	-2.880
	3	-2.6333*	.1394	.000	-3.120	-2.146
	4	-2.9667*	.1394	.000	-3.454	-2.480
3	1	-.7333*	.1394	.006	-1.220	-.246
	2	2.6333*	.1394	.000	2.146	3.120
	4	-.3333	.1394	.207	-.820	.154
4	1	-.4000	.1394	.113	-.887	.087
	2	2.9667*	.1394	.000	2.480	3.454
	3	.3333	.1394	.207	-.154	.820

Multiple Comparisons

Kekerasan

Scheffe

(I) Formulasi	(J) Formulasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	3.3667*	.1394	.000	2.880	3.854
	3	.7333*	.1394	.006	.246	1.220
	4	.4000	.1394	.113	-.087	.887
2	1	-3.3667*	.1394	.000	-3.854	-2.880
	3	-2.6333*	.1394	.000	-3.120	-2.146
	4	-2.9667*	.1394	.000	-3.454	-2.480
3	1	-.7333*	.1394	.006	-1.220	-.246
	2	2.6333*	.1394	.000	2.146	3.120
	4	-.3333	.1394	.207	-.820	.154
4	1	-.4000	.1394	.113	-.887	.087
	2	2.9667*	.1394	.000	2.480	3.454
	3	.3333	.1394	.207	-.154	.820

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Kekerasan

Scheffe[a]

Formulasi	N	Subset for alpha = 0.05		
		1	2	3
2	3	4.133		
3	3		6.767	
4	3		7.100	7.100
1	3			7.500
Sig.		1.000	.207	.113

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

Waktu hancur

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Wktuhncur	12	2.4583	1.26226	.45	3.59

One-Sample Kolmogorov-Smirnov Test

		wktuhncur
N		12
Normal Parameters[a,,b]	Mean	2.4583
	Std. Deviation	1.26226
Most Extreme Differences	Absolute	.263
	Positive	.190
	Negative	-.263
Kolmogorov-Smirnov Z		.912
Asymp. Sig. (2-tailed)		.377

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Test of Homogeneity of Variances

Wktuhncur

Levene Statistic	df1	df2	Sig.
4.839	3	8	.033

ANOVA

Wktuhncur

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17.448	3	5.816	592.962	.000
Within Groups	.078	8	.010		
Total	17.526	11			

Post Hoc Tests

Multiple Comparisons

wktuhncur

Scheffe

(I) Formulasi	(J) Formulasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-3.06000*	.08086	.000	-3.3424	-2.7776
	3	-2.83000*	.08086	.000	-3.1124	-2.5476
	4	-2.06333*	.08086	.000	-2.3458	-1.7809
2	1	3.06000*	.08086	.000	2.7776	3.3424
	3	.23000	.08086	.116	-.0524	.5124
	4	.99667*	.08086	.000	.7142	1.2791
3	1	2.83000*	.08086	.000	2.5476	3.1124
	2	-.23000	.08086	.116	-.5124	.0524
	4	.76667*	.08086	.000	.4842	1.0491
4	1	2.06333*	.08086	.000	1.7809	2.3458
	2	-.99667*	.08086	.000	-1.2791	-.7142
	3	-.76667*	.08086	.000	-1.0491	-.4842

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Wktuhncur

Scheffe[a]

Formulasi	N	Subset for alpha = 0.05		
		1	2	3
1	3	.4700		
4	3		2.5333	
3	3			3.3000
2	3			3.5300
Sig.		1.000	1.000	.116

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

Disolusi

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Disolusi	28	56.7979	21.25855	26.51	100.42

One-Sample Kolmogorov-Smirnov Test

		Disolusi
N		28
Normal Parameters[a,,b]	Mean	56.7979
	Std. Deviation	21.25855
Most Extreme Differences	Absolute	.172
	Positive	.172
	Negative	-.094
Kolmogorov-Smirnov Z		.911
Asymp. Sig. (2-tailed)		.378

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Test of Homogeneity of Variances

Disolusi

Levene Statistic	df1	df2	Sig.
.835	6	21	.557

ANOVA

Disolusi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9702.022	6	1617.004	13.583	.000
Within Groups	2499.980	21	119.047		
Total	12202.002	27			

Post Hoc Tests

Multiple Comparisons

Disolusi

Scheffe

(I) Menit	(J) Menit	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
2 menit	4 menit	-7.49250	7.71514	.985	-37.8045	22.8195
	6 menit	-12.46500	7.71514	.847	-42.7770	17.8470
	8 menit	-18.79250	7.71514	.458	-49.1045	11.5195
	10 menit	-27.13500	7.71514	.102	-57.4470	3.1770
	20 menit	-45.50000*	7.71514	.001	-75.8120	-15.1880
	30 menit	-54.74500*	7.71514	.000	-85.0570	-24.4330
4 menit	2 menit	7.49250	7.71514	.985	-22.8195	37.8045
	6 menit	-4.97250	7.71514	.998	-35.2845	25.3395
	8 menit	-11.30000	7.71514	.897	-41.6120	19.0120
	10 menit	-19.64250	7.71514	.406	-49.9545	10.6695
	20 menit	-38.00750*	7.71514	.008	-68.3195	-7.6955
	30 menit	-47.25250*	7.71514	.001	-77.5645	-16.9405
6 menit	2 menit	12.46500	7.71514	.847	-17.8470	42.7770
	4 menit	4.97250	7.71514	.998	-25.3395	35.2845
	8 menit	-6.32750	7.71514	.994	-36.6395	23.9845
	10 menit	-14.67000	7.71514	.725	-44.9820	15.6420
	20 menit	-33.03500*	7.71514	.026	-63.3470	-2.7230
	30 menit	-42.28000*	7.71514	.003	-72.5920	-11.9680
8 menit	2 menit	18.79250	7.71514	.458	-11.5195	49.1045
	4 menit	11.30000	7.71514	.897	-19.0120	41.6120
	6 menit	6.32750	7.71514	.994	-23.9845	36.6395
	10 menit	-8.34250	7.71514	.975	-38.6545	21.9695
	20 menit	-26.70750	7.71514	.112	-57.0195	3.6045
	30 menit	-35.95250*	7.71514	.013	-66.2645	-5.6405
10 menit	2 menit	27.13500	7.71514	.102	-3.1770	57.4470
	4 menit	19.64250	7.71514	.406	-10.6695	49.9545
	6 menit	14.67000	7.71514	.725	-15.6420	44.9820

	8 menit	8.34250	7.71514	.975	-21.9695	38.6545
	20 menit	-18.36500	7.71514	.485	-48.6770	11.9470
	30 menit	-27.61000	7.71514	.092	-57.9220	2.7020
20 menit	2 menit	45.50000*	7.71514	.001	15.1880	75.8120
	4 menit	38.00750*	7.71514	.008	7.6955	68.3195
	6 menit	33.03500*	7.71514	.026	2.7230	63.3470
	8 menit	26.70750	7.71514	.112	-3.6045	57.0195
	10 menit	18.36500	7.71514	.485	-11.9470	48.6770
	30 menit	-9.24500	7.71514	.958	-39.5570	21.0670
30 menit	2 menit	54.74500*	7.71514	.000	24.4330	85.0570
	4 menit	47.25250*	7.71514	.001	16.9405	77.5645
	6 menit	42.28000*	7.71514	.003	11.9680	72.5920
	8 menit	35.95250*	7.71514	.013	5.6405	66.2645
	10 menit	27.61000	7.71514	.092	-2.7020	57.9220
	20 menit	9.24500	7.71514	.958	-21.0670	39.5570

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

Disolusi

Scheffe[a]

		Subset for alpha = 0.05		
Menit	N	1	2	3
2 menit	4	33.0650		
4 menit	4	40.5575		
6 menit	4	45.5300		
8 menit	4	51.8575	51.8575	
10 menit	4	60.2000	60.2000	60.2000
20 menit	4		78.5650	78.5650
30 menit	4			87.8100
Sig.		.102	.112	.092

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 4.000.

Lampiran 9 : Panjang gelombang makmimum ibuprofen

300	0.057	292	0.057
280	0.057	272	0.080
260	0.081	252	0.069
240	0.061	232	0.289
221	0.776	212	0.655
202	1.247	200	7151

Lampiran 10 : Tablet formula I, formula II, formula III dan formula IV

Formula 1

Formula II

Formula III

Formula IV

Lampiran 11. Skema jalannya penelitian