

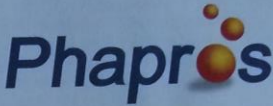


## LAMPIRAN

### Lampiran 1 certificate of analysis Dimenhidrinat



010/S.Pr/PPPP-LPP/III/21  
Semarang, 16 Maret 2021

Kepada Yth:  
Fakultas Farmasi  
Universitas Setia Budi  
d/a Jl. Let. Jend. Sutoyo – Solo 57127  
Telp. 0271 - 852518  
**Up. Ibu Prof. Dr. R.A Oetari, SU., MM., M.Sc., Apt**

**Perihal : Permohonan Bahan Baku**

Dengan hormat,  
Memenuhi permintaan Ibu sesuai surat no. 204/H6-04/01.02.2021 per tgl. 1 Februari 2021 perihal tersebut di atas, bersama ini kami kirimkan :

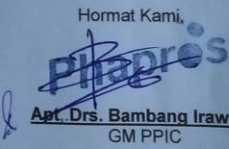
No.	Nama bahan baku	Um	Jumlah	Certificate Of Analisis
1	Dimenhydrinate	Gr	50	√

Untuk keperluan penelitian Mahasiswa :

No.	Nama	NIM
1	Mira Rizki Lestari	23175192A

Mohon diterima dengan baik dan selanjutnya apabila penelitian telah selesai, agar menginformasikan Laporan hasil penelitiannya ke email [diyah.arum@phapros.co.id](mailto:diyah.arum@phapros.co.id)

Demikian, semoga bermanfaat dan terima kasih.

Hormat Kami,  
  
**Apt. Drs. Bambang Irawan**  
GM PPIC

Diterima oleh :  
Tanggal :  
Tanda tangan :

**OFFICE :**  
PT. Phapros Tbk  
Menara Hijau 17<sup>th</sup> Floor  
Jl. GPR 106 Arak Agung Gede Agung  
Kawasan Mega Kuningan  
Jakarta Selatan 12950 INDONESIA  
Phone : (62-21) 576 2750  
Fax : (62-21) 576 3819  
Email : [corporate@phapros.co.id](mailto:corporate@phapros.co.id)  
Website : [www.phapros.co.id](http://www.phapros.co.id)

**FACTORY :**  
PT. Phapros Tbk  
Jl. Simongan no. 131  
Semarang 50148  
INDONESIA  
Phone : (62-24) 766 30021 (hunting)  
Fax : (62-24) 760 5133  
P.O.Box : 1233  
Email : [factory@phapros.co.id](mailto:factory@phapros.co.id)  
Website : [www.phapros.co.id](http://www.phapros.co.id)

37.5.7 Quality Order BB/BK\*  
 PHARPOS, PT  
 Date: 11/12/20  
 Time: 08:58:27

Order No: 1  
 Batch: 44646  
 Item Number: 14304106  
 Insp Loc Procedure: PH  
 Qty Pending: 500.0  
 Qty Accepted: 0.0  
 Qty Rejected: 0.001

Order Date: 11/12/20  
 PR Number: PR204632  
 Exp date item number: 18/03/2025  
 Receipt date: 11/12/20  
 Lot Serial: 20/11/0928C  
 PO Number: P20/1515  
 Qty PO: 2,000.0 Kg  
 Due Date PO: 11/12/20  
 Due Date QC: 21/12/20

Supplier: TIGAKA DISTRIBUTO PERKASA PT  
 Kota: JAKARTA  
 Lot Pabrik: 2003020 ✓  
 - Kg Edisi: Umr produk: 5.0 thn  
 Edisi Spesifikasi: 6 - 04106 k - 00

DESCRIPTION: DIPHENHYDRAMINE

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KEHYATAN BDK. HASUK : DIPHENHYDRAMINE. ✓  
 NAMA PABRIK/ASAL : SHANGHAI NORDER PHARMACEUTICAL. ✓  
 SUDUT JALAH NO : 2010004061  
 KEMASAN & KEMASAN :  
 20 VAT @ 25 KG.  
 MFG. DATE : 19/03/2020 ✓  
 EXP. DATE : 18/03/2025 ✓  
 C.O.A TERLAMPIR.

Op Number	Characteristic	Specification	Actual Results	Measure	Pass
200 01	PENERIHAN Serbuk hablur, putih, tidak berbau	*	Sesuai		✓
02	KELARUTAN Dalam air : Sukar larut Dalam etanol, kloroform : Mudah larut Dalam eter : Agak sukar larut	*	Sesuai		✓
03	IDENTIFIKASI Titik lebur : 102° - 106° C IR Spektrum : Sesuai	*	104.7 Sesuai		✓
04	SUDUT PENGERINGAN	<=0.5 ✓	0.090	PERSEN	✓
05	SISA PENJAJARAN	<=0.3 ✓	0	PERSEN	✓
06	CHLORIDA Larutan menunjukkan tidak lebih dari opalesensi lemah.	*	Sesuai		✓
07	BROWNA & TIDAK Lapisan kloroform tidak berwarna	*	Sesuai		✓
08	pH	7.1 7.6 ✓	7.25		✓
09	KEJERNIHAN & NON LUT Jerah & tidak berwarna	SESUAI	Sesuai		✓
10	KANDUNGAN DIPHENHYDRAMINE	53 55.0	54.25	PERSEN	✓
11	KANDUNGAN D-KLOROTENFELIN	44 47	45.148	PERSEN	✓
12	PETUGAS SAMPLING	*	Wahid Heli		
13	PENERIKSA	*	HSP, KEL. HAWA, S.L.Q		

*Handwritten notes:*  
 15/12/20  
 20/12/20

## Lampiran 2 certificate of analysis HPMC

Version:01 HTP-P-014-04

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**HERCULES**

**Hercules Tianpu Chemicals Company Limited**  
Gaoba, Luzhou, Sichuan, P.R.China  
Tel: +86-830-2796781 Fax:+86-830-2790789  
Correspondence Tel:+86-512-58403682  
Fax:+86-512-58402936

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## Certificate of Analysis

HPMC

Product name	Cellulose Ether		
Grade	LH40MR		
Batch No	VK9150151		
PO No. // SC No.	J.9272 // 4513163		
Quantity	4000KG		
Date of Manufacturing	Mar.14,2015		

Items	Specification		Results
	Min.	Max.	
Moisture (% , as packed)	0.0	8.0	1.5
PSD (% , retained on 0.20mm sieve)	0.0	5.0	1.0
Viscosity (mPa.s)(2% on dry basis , 20°C, Brookfield RVT)	38000	51500	43150

We hereby certify the analysis of the sample as shown above.


Manufacturer: **HERCULES TIANPU CHEMICALS COMPANY LIMITED**

For and on behalf of  
Hercules Tianpu  
Company Limited

.....  
Authorized signature(s)

## Lampiran 3 certificate of analysis maltodextrin

**ORIGINAL**

 **QINHUANGDAO LIHUA STARCH CO., LTD.**

Add.: NO.89, LIHUA STREET, FJNING DISTRICT, QINHUANGDAO CITY, HEBEI PROVINCE, CHINA.066300

**CERTIFICATE OF ANALYSIS**

LHCO3-19

PRODUCT NAME	MALTODEXTRIN DE 10-12	REPORT NO.	01
BATCH NO.	20191029	PACKING	25KG/BAG
QUANTITY(MT)	52 MT	PRODUCING DATE	OCT. 29, 2019
PRODUCTION UNIT	MALTO DEXTRIN WORKSHOP	DATE OF EXPIRY	OCT. 28, 2021
TEST BASE	GB/T20884-2007	TEST OBJECT	ALL

TEST ITEM	TEST BASE	TEST RESULT
CHARACTER	WHITE POWDER WITH YELLOWISH SHADOW, NON IRREGULAR SHAPE, NON VISIBLE IMPURITIES BY NAKED EYES, WITH THE SPECIAL FLAVOR OF MALTO DEXTRIN, SWEETISH OR NOT, NO ODOR.	WHITE POWDER WITH YELLOWISH SHADOW, NON IRREGULAR SHAPE, NON VISIBLE IMPURITIES BY NAKED EYES, WITH THE SPECIAL FLAVOR OF MALTO DEXTRIN, SWEETISH OR NOT, NO ODOR.
DE VALUE, % (M/M)	10-12	11.3
WATER, % (M/M)	≤6	5.4
SOLUBILITY	≥98	99.1
PH VALUE	4.5-6.5	5.3
SULPHATE ASH % (M/M)	≤0.6	0.1
IODINE TEST	NEGATIVE	NEGATIVE
ARSENIC(AS), MG/KG	≤0.5	0.1
PB, MG/KG	≤0.5	0.1
COLIFORM(MPN/100 G)	≤30	NONE
TOTAL BACILLUS(MPN/100 G)	≤3000	10
SALMONELLA	NONE	NONE

CONCLUSION: THE PRODUCT COMPLY WITH THE SPECIFICATION OF GB/T20884-2007

MINISTER: LI YA FEN      CHECKER: CONG WEI      EXAMINANT: SONG LI LI  
 MANUFACTURER: QINHUANGDAO LIHUA STARCH CO., LTD.  
 INVOICE: LH198529  
 CONTRACT NO.: POIF-19-00308      *Jack Chee*  
 NAME: JACK CHEE  
 JOB TITLE: INTERNATIONAL TRADE DEPT. MANAGER

### Lampiran 4 certificate of analysis aspartam

**Certificate of Analysis**

**Product Name** Vitasweet® Aspartame (E951)  
**Synonyms** Aspartame, Aspartyl Phenylalanine Methyl Ester, APM  
**Definition** Chemical name: N-L- $\alpha$ -Aspartyl-L-Phenylalanine-1-Methyl Ester  
 C.A.S. number: 22839-47-0  
 Chemical formula:  $C_{14}H_{18}N_2O_5$   
 Molecular weight: 294.31

**Description** Odorless, sweet and white crystalline powder  
**Functional Use** High potency-low caloric sweetener  
**Tests and Methods** FCC10, FAO/WHO JECFA, EP8, USP38-NF33.

Batch Number: 1803004LP      Batch Size: 7500KG      Date of Production: FEB. 08. 2018


Test	Requirement	Result
Identification	Conform to CP2005	Conform
Loss on drying	$\leq 4.5\%$	3.32%
Residue on ignition	$\leq 0.2\%$	0.08%
Assay	98.0% ~ 102.0%	99.10%
Conductivity	$\leq 30 \mu \text{ s/cm}$	22.34 $\mu \text{ s/cm}$
PH	4.5 ~ 6.0	5.17
Specific rotation	+14.5° ~ +16.5°	+15.00°
Transmittance	$\geq 95.0\%$	99.60%
L-phenylalanine	$\leq 0.5\%$	Not found
L- $\alpha$ -aspartyl-L-phenylalanine	$\leq 0.25\%$	0.07%
Diketopiperazine	$\leq 1.5\%$	0.05%
Other related substances	$\leq 2.0\%$	0.36%
Appearance of solution	Conform to EP	Conform
Heavy metals (as Pb)	$\leq 10\text{ppm}$	< 5ppm
Lead	$\leq 1\text{ppm}$	< 1ppm
Arsenic	$\leq 3\text{ppm}$	< 2ppm

Statement The product meets the requirements of FCC10, FAO/WHO JECFA, EP8, USP38 and NF33.

## Lampiran 5 surat keterangan ethical clearance

2/17/2021

KEPK-RSDM



**HEALTH RESEARCH ETHICS COMMITTEE**  
**KOMISI ETIK PENELITIAN KESEHATAN**

***Dr. Moewardi General Hospital***  
**RSUD Dr. Moewardi**

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**ETHICAL CLEARANCE**  
**KELAIKAN ETIK**

Nomor : 100 / II / HREC / 2021

The Health Research Ethics Committee Dr. Moewardi  
Komisi Etik Penelitian Kesehatan RSUD Dr. Moewardi

after reviewing the proposal design, herewith to certify  
setelah menilai rancangan penelitian yang diusulkan, dengan ini menyatakan

That the research proposal with topic :  
Bahwa usulan penelitian dengan judul


**Formulasi dan Optimasi Sediaan Orally Dissolving Film Dimenhidrinat dengan Kombinasi HPMC E5 dan Maltodextrin dengan Metode Simplex Lattice Design**

Principal investigator : Mira Rizki Lestari  
Peneliti Utama 23175192A

Location of research : Laboratorium Universitas Setia Budi  
Lokasi Tempat Penelitian

Is ethically approved  
Dinyatakan layak etik

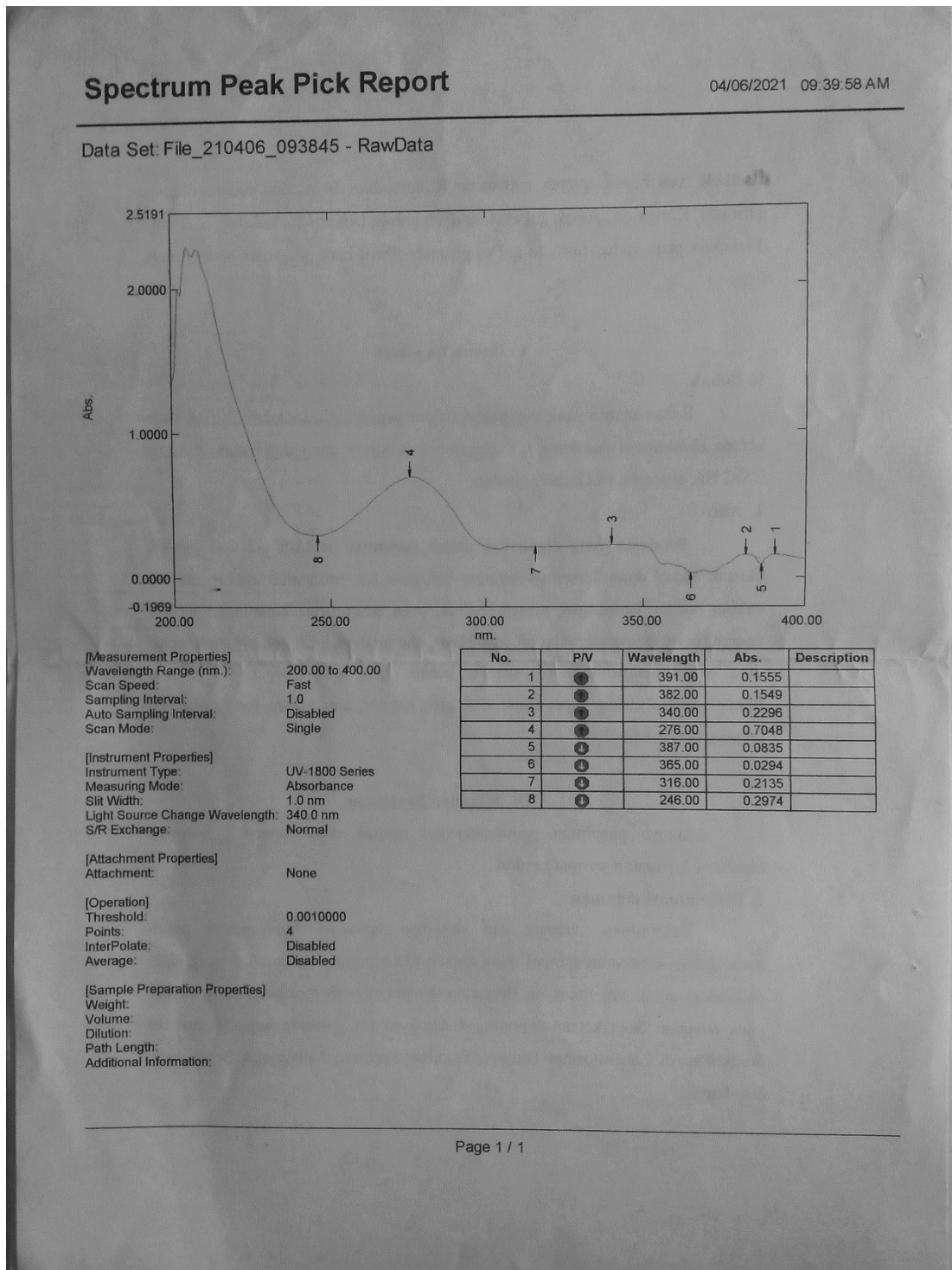
Issued on : 17 Februari 2021

Chairman  
Ketua  
  
Dr. Wahyu Dwi Atmoko, Sp.F  
19770224 201001 1 004

<https://komisi-etika.rsmdoewardi.com/kank/ethicalclearance/23175192A-0152>

1/1

## Lampiran 6 profil lamda maksimal uji keseragaman kandungan



Lampiran 7 profil *operating time* untuk uji keseragaman kandungan

**Kinetics Data Print Report**

04/06/2021 01:43:46 PM

Time ( Minute )	RawData ...
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6.000	0.489
7.000	0.489
8.000	0.489
9.000	0.489
10.000	0.489
11.000	0.489
12.000	0.489
13.000	0.489
14.000	0.489
15.000	0.489
16.000	0.489
17.000	0.489
18.000	0.490
19.000	0.489
20.000	0.490
21.000	0.489
22.000	0.489
23.000	0.489
24.000	0.489
25.000	0.489
26.000	0.489
27.000	0.489
28.000	0.489
29.000	0.489
30.000	0.489
31.000	0.489
32.000	0.489
33.000	0.489
34.000	0.489
35.000	0.489
36.000	0.489
37.000	0.489
38.000	0.489
39.000	0.489
40.000	0.489
41.000	0.489
42.000	0.489
43.000	0.489
44.000	0.488
45.000	0.489
46.000	
47.000	
48.000	
49.000	
50.000	

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### Lampiran 8 contoh perhitungan keseragaman kandungan

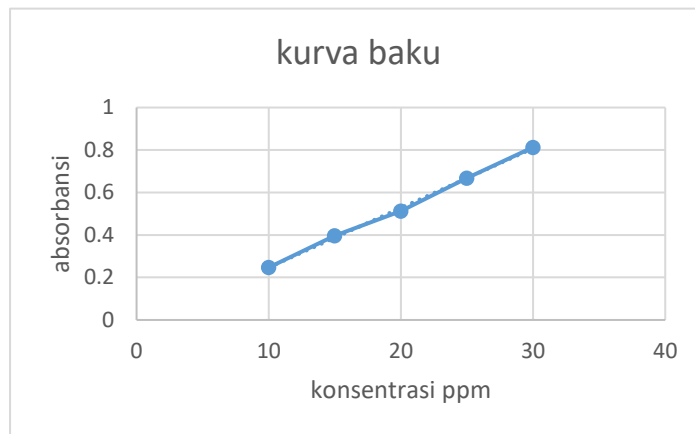
Kurva baku keseragaman kandungan

Konsentrasi (ppm)	Absorbansi
10	0.247
15	0.397
20	0.513
25	0.667
30	0.813

$$A = -0,0334$$

$$B = 0,02804$$

$$R = 0,999$$



ODF	Serapan	Kadar (ppm)	Jumlah terukur (mg)	Kandungan (%)
1	0,627	23,5521	11,77605	94,2084
2	0,631	23,6947	11,84784735	94,7788
3	0,650	24,3723	12,18615	97,4892
4	0,602	22,6605	11,33025	90,642
5	0,616	23,1598	11,5799	92,6392
6	0,643	24,1227	12,06135	96,4908
7	0,643	24,1227	12,06135	96,4908
8	0,612	23,0171	11,50855	92,0684
9	0,630	23,6591	11,82955	94,6364
10	0,617	23,1954	11,5977	92,7816

Rata-rata	94,2226
SD	2,1981
NP	9,55284

Contoh Perhitungan keseragaman kandungan ODF 1

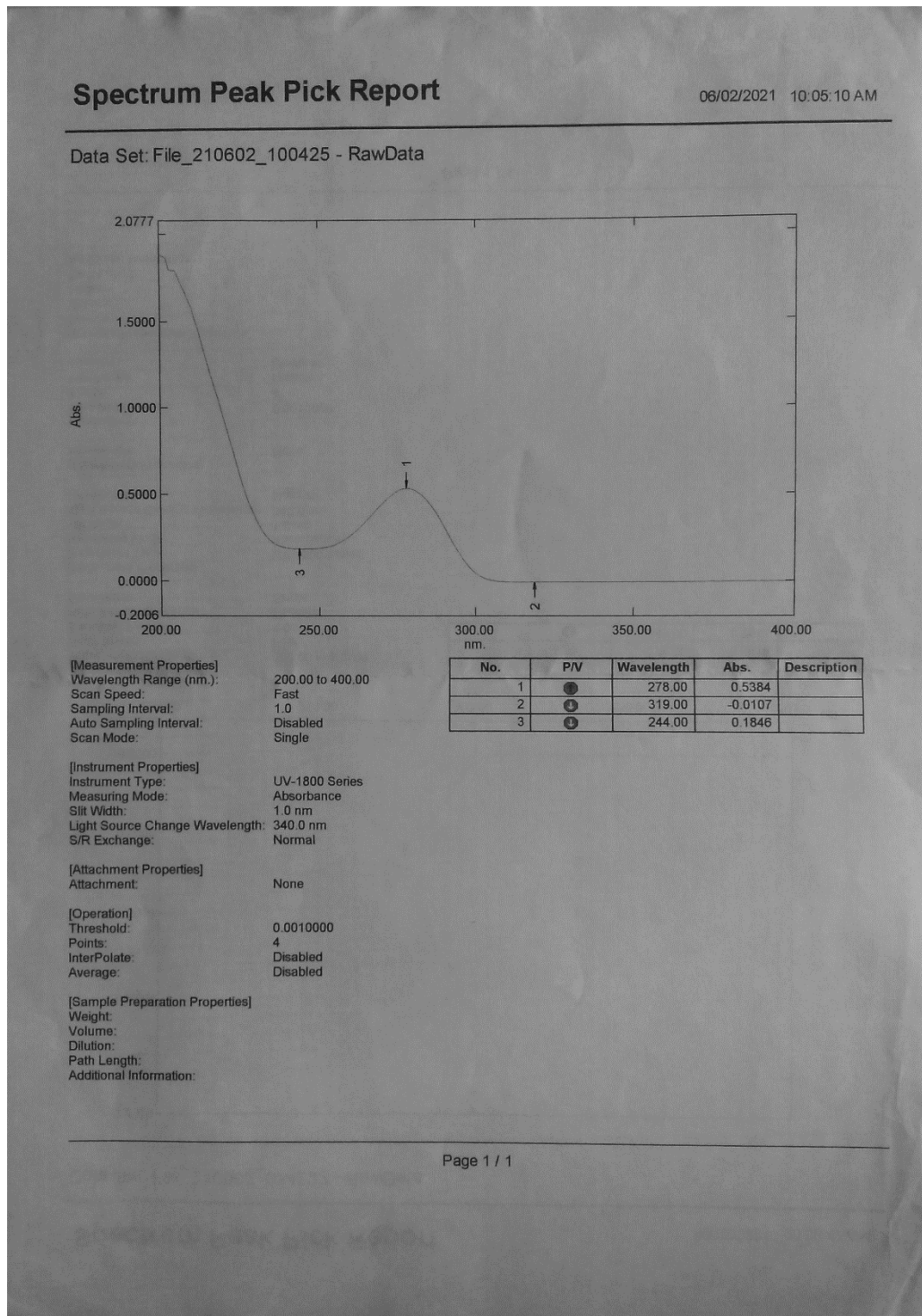
$$\text{Kadar} = \frac{y-a}{b} = \frac{0,627 - (-0,0334)}{0,02804} = 23,5521 \text{ ppm}$$

$$\begin{aligned} \text{Jumlah terukur} &= \text{kadar} \times \text{faktor pengenceran} \times \text{volume pembuatan} \\ &= \frac{23,5521}{1000} \times 10 \times 50 = 11,77605 \text{ mg} \end{aligned}$$

$$\text{Kandungan \%} = \frac{\text{jumlah terukur}}{12,5 \text{ mg}} \times 100\% = \frac{11,77605}{12,5} \times 100\% = 94,2084$$

$$\begin{aligned} \text{NP} &= 98,5 - \text{ratarata} + \text{k. s} \\ &= 98,5 - 94,2226 + (2,4 \cdot 2,1982) \\ &= 9,55284 \% \end{aligned}$$

## Lampiran 9 profil lamda maksimal uji disolusi



Lampiran 10 profil *operating time* uji disolusi

## Kinetics Data Print Report

06/03/2021 01:20:21 PM

Time ( Minute )	RawData ...
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7.000	0.561
8.000	0.561
9.000	0.560
10.000	0.560
11.000	0.559
12.000	0.559
13.000	0.559
14.000	0.559
15.000	0.559
16.000	0.559
17.000	0.560
18.000	0.560
19.000	0.560
20.000	0.560
21.000	0.560
22.000	0.560
23.000	0.559
24.000	0.559
25.000	0.560
26.000	0.560
27.000	0.560
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29.000	0.560
30.000	0.559
31.000	0.560
32.000	0.560
33.000	0.558
34.000	0.560
35.000	0.560
36.000	0.559
37.000	0.560
38.000	0.561
39.000	0.560
40.000	0.560
41.000	0.560
42.000	0.561
43.000	0.560
44.000	0.561
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46.000	0.560
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50.000	0.560

## Kinetics Data Print Report

06/03/2021 01:20:21 PM

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Time ( Minute )	RawData ...
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54.000	0.561
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56.000	0.561
57.000	0.561
58.000	0.560
59.000	0.560
60.000	0.560

### Lampiran 11 contoh perhitungan persen disolusi dan disolusi efisiensi

#### a. Verifikasi metode analisis

##### 1. Linieritas

Kurva baku disolusi

Konsentrasi (ppm)	Absorbansi
0	0
10	0.275
15	0.424
20	0.556
25	0.716
30	0.845

$$A = -0,0096$$

$$B = 0,002864$$

$$C = 0,9996 \text{ mendekati nilai } 1$$



##### 2. LOD dan LOQ

Konsentrasi ppm	absorbansi	$y'$	$y-y'$	$y-y'^2$
0	0	0	0	0
10	0.275	0.2768	-0.0018	3.24E-06
15	0.424	0.42	0.004	0.000016
20	0.556	0.5632	-0.0072	5.18E-05
25	0.716	0.7064	0.0096	9.22E-05
30	0.845	0.8496	-0.0046	2.12E-05

Jumlah	0.000184
Hasil	4.61E-05
sy/x	0.00679
LOD	0.782333
LOQ	2.370705
vx zero	0.014224

### Contoh perhitungan konsentrasi 10ppm

$$\text{Rata-rata kons} = (0 + 10 + 15 + 20 + 25 + 30) : 6 = 16,66667$$

$$\begin{aligned} Y' &= a + (b \times \text{konsentrasi}) \\ &= -0,0096 + (0,002864 \times 10) = 0,2768 \end{aligned}$$

$$y - y' = \text{absorbansi} - y' = 0,275 - 0,2768 = -0,0018$$

$$y - y'^2 = (-0,0018)^2 = 3,24E-06$$

$$\begin{aligned} \text{jumlah} &= 0 + 3,24E-06 + 0.000016 + 5.18E-05 + 9.22E-05 + \\ &2.12E-05 \\ &= 0.000184 \end{aligned}$$

$$\text{Hasil} = \text{jumlah} : (n-2) = 0.000184 : (6-2) = 4.61E-05$$

$$\text{Sy/x} = \text{RSD dari hasil} = 0.00679$$

$$\begin{aligned} \text{LOD} &= (3,3 \cdot \text{sy/x}) : b = (3,3 \cdot 0,00679) / 0,002864 \\ &= 0,782333 \end{aligned}$$

$$\begin{aligned} \text{LOQ} &= (10 \cdot \text{sy/x}) : b = (10 \cdot 0,00679) / 0,002864 \\ &= 2,370705 \end{aligned}$$

$$\begin{aligned} \text{Vx zero} &= (\text{sy/x}) : (b \times \text{rata-rata konsentrasi}) \\ &= 0,00679 : (0,002864 \times 16,66667) \\ &= 0,014224 \end{aligned}$$

### 3. Presisi

replikasi	konsentrasi ppm	absorbansi	x	x rata-rata	SD	RSD
1	10	0.287	10.35615	10.32705	5.1395%	0.4977%
2	10	0.284	10.2514			
3	10	0.286	10.32123			
4	10	0.287	10.35615			

5	10	0.285	10.28631
6	10	0.288	10.39106

Perhitungan replikasi 1

$$X = \frac{y-a}{b} = \frac{0,287-(-0,0096)}{0,002864} = 10,35615$$

Perhitungan replikasi 2

$$X = \frac{y-a}{b} = \frac{0,284-(-0,0096)}{0,002864} = 10,2514$$

Perhitungan replikasi 1

$$X = \frac{y-a}{b} = \frac{0,286-(-0,0096)}{0,002864} = 10,32123$$

Perhitungan replikasi 1

$$X = \frac{y-a}{b} = \frac{0,287-(-0,0096)}{0,002864} = 10,35615$$

Perhitungan replikasi 1

$$X = \frac{y-a}{b} = \frac{0,285-(-0,0096)}{0,002864} = 10,28631$$

Perhitungan replikasi 1

$$X = \frac{y-a}{b} = \frac{0,288-(-0,0096)}{0,002864} = 10,39106$$

$$X \text{ rata-rata} = (10,35615 + 10,2514 + 10,32123 + 10,35615 + 10,28631 + 10,39106) : 6 = 10,32705$$

#### 4. Akurasi

konsentrasi ppm	absorbansi	x	konsentrasi dalam persen	konsentrasi rata-rata	Rata-rata seluruhnya
10	0.289	10.4260	104%	103%	101%
	0.286	10.3212	103%		
	0.285	10.2863	103%		
15	0.42	15.0000	100%	99%	101%
	0.41	14.6508	98%		
	0.419	14.9651	100%		



20	0.574	20.3771	102%	101%
	0.571	20.2723	101%	
	0.569	20.2025	101%	

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Contoh perhitungan konsentrasi 10 ppm

Perhitungan replikasi 1

$$X = \frac{y-a}{b} = \frac{0,289-(-0,0096)}{0,002864} = 10,4260$$

Perhitungan replikasi 2

$$X = \frac{y-a}{b} = \frac{0,286-(-0,0096)}{0,002864} = 10,3212$$

Perhitungan replikasi 2

$$X = \frac{y-a}{b} = \frac{0,285-(-0,0096)}{0,002864} = 10,2863$$

$$\begin{aligned} X \text{ dalam persen} &= (x : \text{konsentrasi ppm}) \times 100 \% \\ &= (10,4260 : 10) \times 100\% \\ &= 104\% \end{aligned}$$

$$\begin{aligned} X \text{ dalam persen} &= (x : \text{konsentrasi ppm}) \times 100 \% \\ &= (10,3212 : 10) \times 100\% \\ &= 103\% \end{aligned}$$

$$\begin{aligned} X \text{ dalam persen} &= (x : \text{konsentrasi ppm}) \times 100 \% \\ &= (10,2863 : 10) \times 100\% \\ &= 103\% \end{aligned}$$

$$\text{Konsentrasi rata-rata} = 104 + 103 + 103 = 103\%$$

$$\text{Rata-rata seluruhnya} = (103 + 99 + 101) : 6 = 101\%$$

## b. Contoh perhitungan formula 1 replikasi 1

waktu	serapan	Kadar	K (mg)	F koreksi	TKW	W <sub>tot</sub>	% disolusi	Rata-rata	SD
5	0,488	17,3743	15,6369	0,0000	0,0000	15,6369	125,0950	124,9274	0,2903
	0,486	17,3045	15,5740	0,0000	0,0000	15,5740	124,5922		
	0,488	17,3743	15,6369	0,0000	0,0000	15,6369	125,0950		
10	0,379	13,5684	12,2116	0,0869	0,0869	12,2985	98,3877	99,0572	0,5798
	0,383	13,7081	12,3373	0,0865	0,0865	12,4238	99,3905		
	0,383	13,7081	12,3373	0,0869	0,0869	12,4242	99,3933		
15	0,382	13,6732	12,3059	0,0678	0,1547	12,4606	99,6846	100,4416	0,6672
	0,387	13,8478	12,4630	0,0685	0,1551	12,6181	100,9444		
	0,386	13,8128	12,4316	0,0685	0,1554	12,5870	100,6958		
30	0,375	13,4288	12,0859	0,0684	0,2231	12,3090	98,4718	98,7302	0,2570
	0,376	13,4637	12,1173	0,0692	0,2243	12,3416	98,7330		
	0,377	13,4986	12,1487	0,0691	0,2245	12,3732	98,9858		
45	0,361	12,9399	11,6459	0,0671	0,2902	11,9362	95,4894	95,2464	0,2444
	0,36	12,9050	11,6145	0,0673	0,2916	11,9061	95,2492		
	0,359	12,8701	11,5831	0,0675	0,2920	11,8751	95,0006		

Contoh perhitungan pada menit ke-5

Replikasi 1

$$\text{Kadar} = \frac{y-a}{b} = \frac{0,488 - (-0,0096)}{0,002864} = 17,3743 \text{ ppm}$$

$$\begin{aligned} \text{K (mg)} &= \text{kadar ppm} \times \text{volume media} \\ &= \frac{17,3743 \text{ ml}}{1000 \text{ ml}} \times 900 \text{ ml} = 15,6369 \text{ mg} \end{aligned}$$

$$\begin{aligned} \text{F koreksi} &= \frac{\text{volume sampling}}{\text{volume media}} \times K_{n-1} \\ &= \frac{5 \text{ ml}}{900 \text{ ml}} \times 0 = 0 \end{aligned}$$

$$\text{TKW} = \text{TKW}_{n-1} + \text{F koreksi} = 0 + 0 = 0$$

$$\text{W}_{\text{tot}} = \text{K} + \text{TKW} = 15,6369 + 0 = 15,6369 \text{ mg}$$

$$\% \text{ disolusi} = \frac{\text{W}_{\text{tot}}}{\text{bobot zat aktif}} \times 100\%$$

$$= \frac{15,6369}{12,5} \times 100\% = 125,0950 \%$$

Keterangan :

K (mg) = jumlah obat dalam mg

F koreksi = faktor koreksi

$K_{n-1}$  (mg) = jumlah obat dalam mg pada pengambilan sampling sebelumnya

TKW (mg) = total koreksi

$TKW_{n-1}$  (mg) = total koreksi pada sampling sebelumnya

$W_{tot}$  = total obat terdisolusi

Contoh perhitungan disolusi efisiensi formula 1

Replikasi 1

$$AUC_0^5 = \frac{(K \text{ mg} 5 + 0)(5 - 0)}{2} = \frac{(15,6369 + 0)(5 - 0)}{2} = 39,0922$$

$$AUC_5^{10} = \frac{(K \text{ mg} 5 + K \text{ mg} 10)(10 - 5)}{2} = \frac{(15,6369 + 12,2116)(10 - 5)}{2} = 69,6212$$

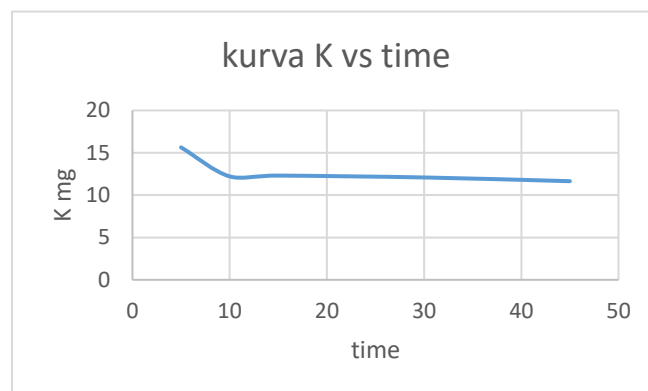
$$AUC_{10}^{15} = \frac{(K \text{ mg} 10 + K \text{ mg} 15)(15 - 10)}{2} = \frac{(12,2116 + 12,3059)(15 - 10)}{2} = 61,2936$$

$$AUC_{15}^{30} = \frac{(K \text{ mg} 15 + K \text{ mg} 30)(30 - 15)}{2} = \frac{(12,3059 + 12,0859)(30 - 15)}{2} = 182,9382$$

$$AUC_{30}^{45} = \frac{(K \text{ mg} 30 + K \text{ mg} 45)(45 - 30)}{2} = \frac{(12,0859 + 11,6459)(45 - 30)}{2} = 177,9888$$

$$AUC \text{ total} = 39,0992 + 69,6212 + 61,2936 + 182,9382 + 177,9888 = 530,9340$$

$$DE_{45} = \frac{AUC \text{ total}}{\text{luas total area}} \times 100\% = \frac{530,9340}{(100 \times 45)} \times 100\% = 11,7985\%$$



**Lampiran 12 format penilaian *taste acceptability*****LEMBAR PENILAIAN *TASTE ACCEPTABILITY***

JUDUL : FORMULASI DAN OPTIMASI SEDIAAN ORALLY DISSOLVING FILM DIMENHIDRINAT DENGAN KOMBINASI HPMC E5 DAN MALTODEXTRIN DENGAN METODE *SIMPLEX LATTICE DESIGN*

INTRUKSI : **Sebelum memberi penilaian kumur terlebih dahulu dengan menggunakan air kemudian berikan pendapat anda tentang rasa (jangan di telan) kemudian kumur kembali dan beri tanda centang (√) pada salah satu kolom di bawah ini:**

NAMA :

UMUR :

SEDIAAN	PENILAIAN		
	+	++	+++
F1			
F2			
F3			
F4			
F5			
F6			
F7			
F8			

KETERANGAN :

+ = sedikit pahit setelah dicicipi

++ = sedang hingga pahit

+++ = sangat pahit

Surakarta, Juni 2021

Panelis,

(.....)

Nama panelis	Penilaian rasa							
	F1	F2	F3	F4	F5	F6	F7	F8
Ria	++	+	+++	+++	+	+	+	+
Evita	++	+++	++	++	+	+	+	+
Yani	+	++	++	+	+	+	+	+
vallery	+	+	+++	+	+++	++	++	++
Pipit	+	++	+	+	++	+	++	++
Prela	+++	+	++	+	++	++	+	+++
Mafi	+	++	++	+++	+++	+++	+++	+++
Anita	+	++	+	+++	+++	+++	+++	+++
Silvia	+	+	++	+++	+++	+++	+++	+++
Kinanthi	+	+++	+++	+++	+++	+	++	+++
	+= 7	+= 4	+= 3	+++ = 4	+= 3	+= 5	+= 4	+= 3
Total	++ = 2	++ = 4	++ = 5	++ = 1	++ = 2	++ = 2	++ = 3	++ = 2
	+++ = 1	+++ = 2	+++ = 2	+= 5	+++ = 5	+++ = 3	+++ = 3	+++ = 5

**KETERANGAN :**

- + = sedikit pahit setelah dicicipi
- ++ = sedang hingga pahit
- +++ = sangat pahit

## Lampiran 13 hasil ANOVA optimasi *simplex lattice design*

### a. Penentuan formula optimum

#### 1. *Folding endurance*

D:\proposalskiprs\optimasi.dxp\* - Design-Expert 11

File Edit View Display Options Design Tools Help

Navigation Pane

- Design (Actual)
  - Information
    - Notes
    - Summary
    - Graph Columns
    - Evaluation
    - Constraints
  - Analysis
    - R1:FOLDING ENDURANCE
    - R2:DISOLUSI Q (Analyze)
    - R3:DISOLUSI DE (Analyze)
  - Optimization
    - Numerical
    - Graphical
  - Post Analysis
    - Point Prediction
    - Confirmation
    - Coefficients Table

Analysis of Variance

### ANOVA for Cubic model

Response 1: FOLDING ENDURANCE

Source	Sum of Squares	df	Mean Square	F-value	p-value	
<b>Model</b>	642.88	3	214.29	111.71	0.0003	significant
(1) Linear Mixture	105.95	1	105.95	55.23	0.0018	
AB	2.71	1	2.71	1.41	0.3005	
AB(A-B)	534.23	1	534.23	278.49	< 0.0001	
<b>Residual</b>	7.67	4	1.92			
Lack of Fit	1.83	1	1.83	0.9394	0.4039	not significant
Pure Error	5.84	3	1.95			
<b>Cor Total</b>	650.56	7				

(1) Inference for linear mixtures uses Type I sums of squares.

Mixture Component coding is **L\_Pseudo**.  
Sum of squares is **Type III - Partial**.

The **Model F-value** of 111.71 implies the model is significant. There is only a 0.03% chance that an F-value this large could occur due to noise.

**P-values** less than 0.0500 indicate model terms are significant. In this case

Fit Statistics

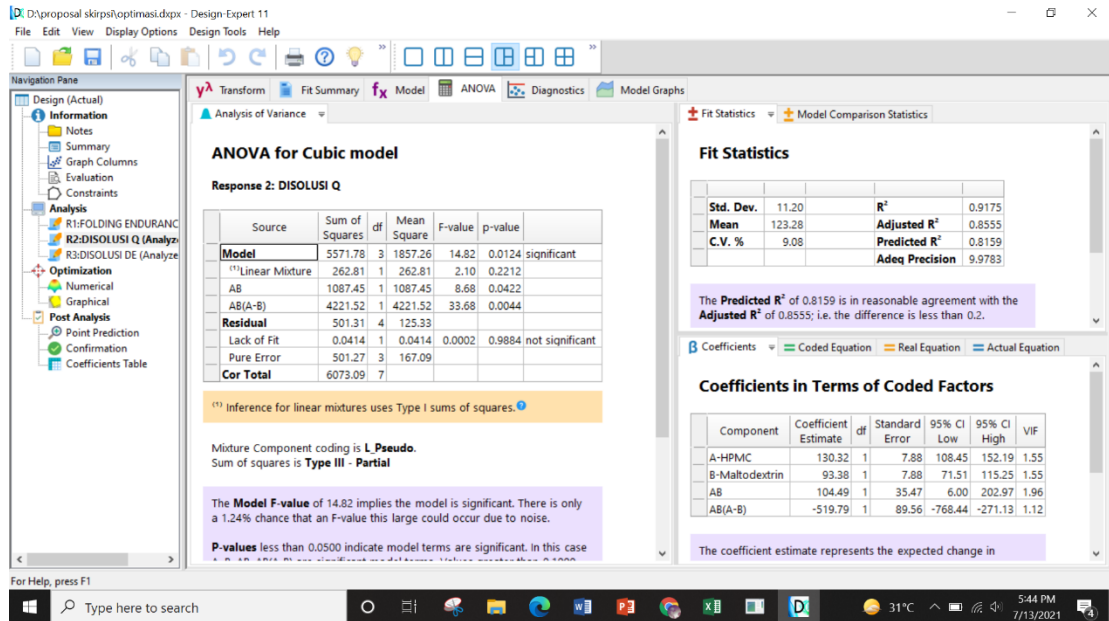
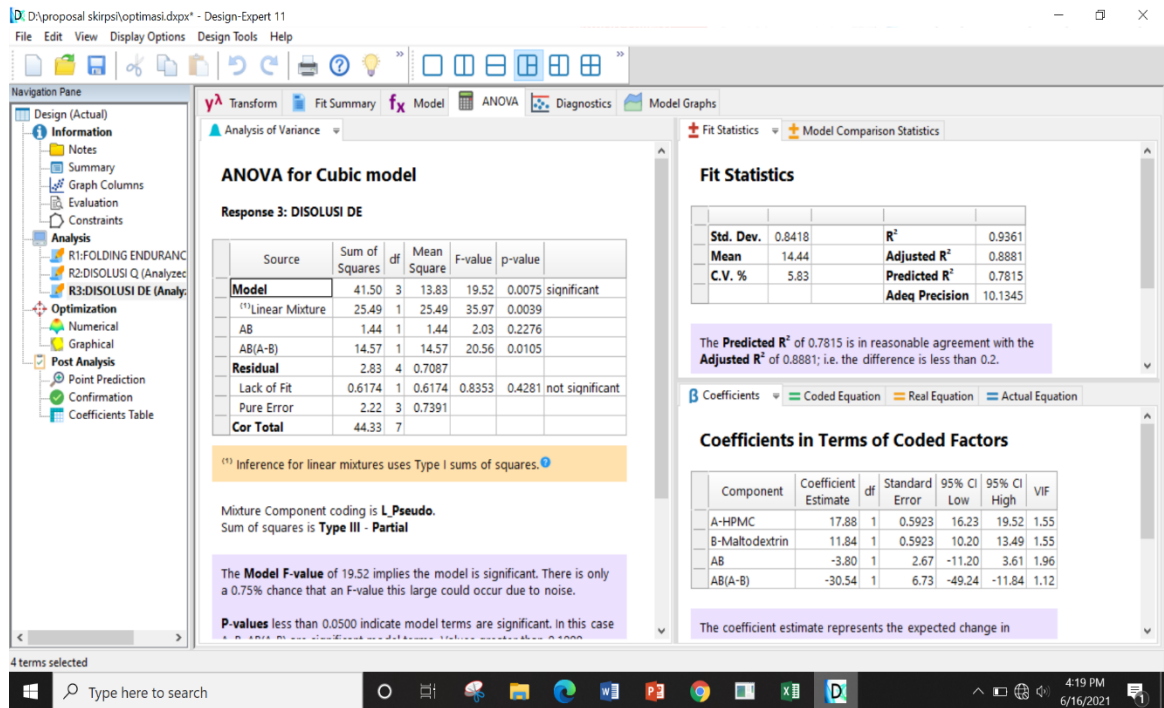
Std. Dev.	1.39	R <sup>2</sup>	0.9882
Mean	20.00	Adjusted R <sup>2</sup>	0.9794
C.V. %	6.93	Predicted R <sup>2</sup>	0.9482
		Adeq Precision	36.4220

The Predicted R<sup>2</sup> of 0.9482 is in reasonable agreement with the Adjusted R<sup>2</sup> of 0.9794; i.e. the difference is less than 0.2.

Coefficients = Coded Equation = Real Equation = Actual Equation

### Final Equation in Terms of L\_Pseudo Components

FOLDING ENDURANCE	=	
		+20.43 * A
		+18.43 * B
		+5.21 * AB
		+184.91 * AB(A-B)

2. % disolusi ( $Q_{45}$ )3. Disolusi efisiensi (DE<sub>45</sub>)

## b. Verifikasi formula optimum

1. *Folding endurance*

## One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
FOLDING_ENDURANCE	3	32,333333	3,5118846	2,0275875

## One-Sample Test

	Test Value = 27,88666					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
FOLDING_ENDURANCE	2,193	2	,160	4,4466733	-4,277332	13,170678

2.  $Q_{45}$ 

## One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q45	3	107,724467	8,3448756	4,8179162

## One-Sample Test

	Test Value = 94,6525					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Q45	2,713	2	,113	13,0719667	-7,657854	33,801787

3.  $DE_{45}$ 

## One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
DE45	3	13,954600	,7913407	,4568807

## One-Sample Test

	Test Value = 14,2244					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
DE45	-,591	2	,615	-,2698000	-2,235599	1,695999



**Lampiran 14 alat penelitian**

Digital screw micrometer



dissolution tester

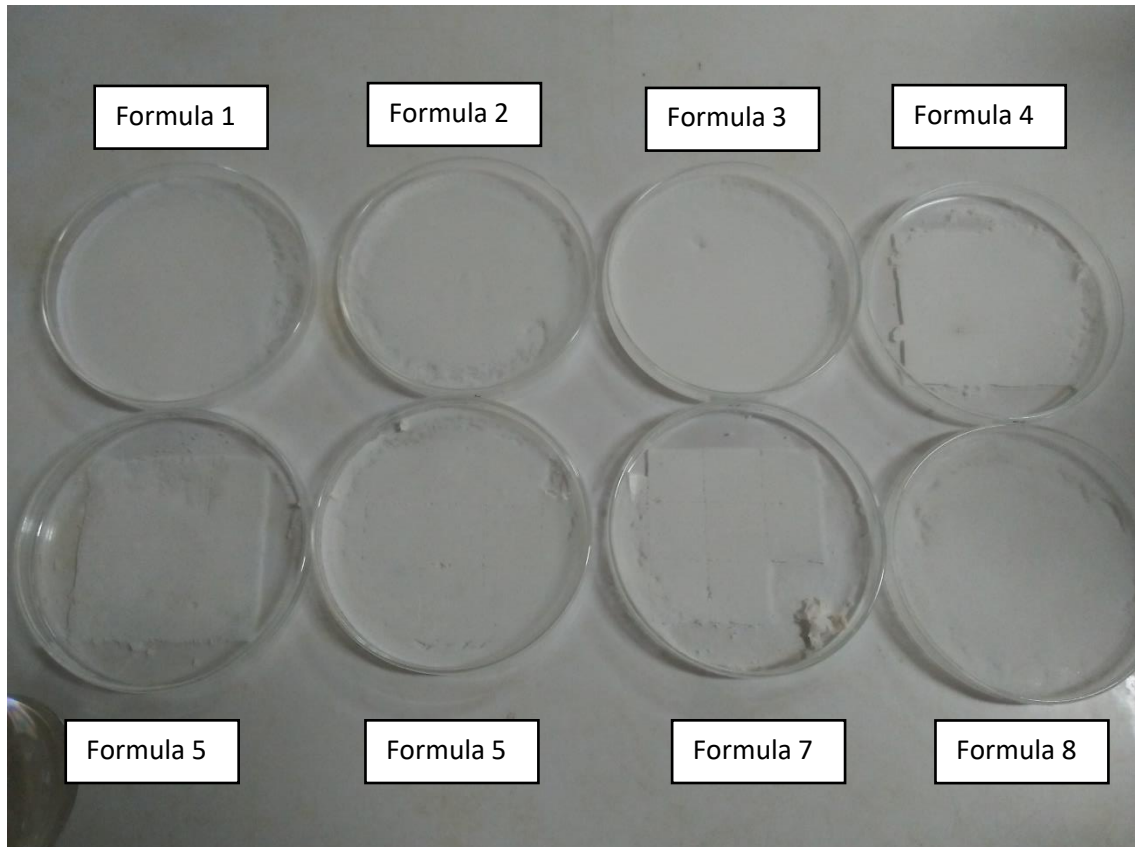


pH meter



spektrofotometer Uv-Vis

**Lampiran 15 hasil ODF dimenhidrinat**



perhitungan bahan yang ditimbang

$$\text{Diameter petri dish} = 9 \text{ cm}$$

$$\text{Jari-jari} = 4,5 \text{ cm}$$

$$\text{Luas petri dish} = \pi r^2 = 3,14 \times 4,5^2 = 63,585 \text{ cm}^2$$

a. Dimenhidrinat 12,5 mg

$$\text{Dosis 12,5 mg dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{Dimenhidrinat yang ditimbang} = 63,585 \infty x$$

$$4 \infty 12,5 \text{ mg}$$

$$\bullet \quad 4x = 794,8125$$

$$x = \frac{794,8125}{4} = 198,7031 \text{ mg}$$

$$= 0,1987 \text{ gram}$$

b. Explotab 10 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{Expotab yang ditimbang} = 63,585 \infty x$$

$$4 \infty 10 \text{ mg}$$

$$4x = 635,85$$

$$x = \frac{635,85}{4} = 158,9625 \text{ mg}$$

$$= 0,1589 \text{ gram}$$

c. PEG 400 10 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{PEG 400 yang ditimbang} = 63,585 \infty x$$

$$4 \infty 10 \text{ mg}$$

$$4x = 635,85$$

$$x = \frac{635,85}{4} = 158,9625 \text{ mg}$$

$$= 0,1589 \text{ gram}$$

d. Asam sitrat 3,6

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{Asam sitrat yang ditimbang} = 63,585 \infty x$$

$$4 \infty 3,6 \text{ mg}$$

$$4x = 228,906$$

$$x = \frac{228,906}{4} = 57,2265 \text{ mg}$$

$$= 0,0572 \text{ gram}$$

e. Menthol 2 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{Menthol yang ditimbang} = 63,585 \infty x$$

$$4 \infty 2 \text{ mg}$$

$$4x = 127,17$$

$$x = \frac{127,17}{4} = 31,7925 \text{ mg}$$

$$= 0,0317 \text{ gram}$$

f. Aspartam 10 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{Aspartam yang ditimbang} = 62,775 \infty x$$

$$4 \infty 10 \text{ mg}$$

$$4x = 635,85$$

$$x = \frac{635,85}{4} = 158,9625 \text{ mg}$$

$$= 0,1589 \text{ gram}$$

g. HPMC dan maltodextrin

- Formula 1 & 3

- HPMC 1 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{HPMC yang ditimbang} = 63,585 \infty x$$

$$4 \infty 1 \text{ mg}$$

$$4x = 63,585$$

$$x = \frac{63,585}{4} = 15,89625 \text{ mg}$$

$$= 0,01589 \text{ gram}$$

- Maltodextrin 1 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{maltodextrin yang ditimbang} = 63,585 \infty x$$

$$4 \infty 1 \text{ mg}$$

$$4x = 63,585$$

$$x = \frac{63,585}{4} = 15,89625 \text{ mg}$$

$$= 0,01589 \text{ gram}$$

- Formula 2 & 8

- HPMC 1,8 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{HPMC yang ditimbang} = 63,585 \infty x$$

$$4 \infty 1,8 \text{ mg}$$

$$4x = 114,453$$

$$x = \frac{114,453}{4} = 28,61325 \text{ mg}$$

$$= 0,0286 \text{ gram}$$

- Maltodextrin 0,2 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{maltodextrin yang ditimbang} = 63,585 \infty x$$

$$4 \infty 0,2 \text{ mg}$$

$$4x = 12,717$$

$$x = \frac{12,717}{4} = 3,17925 \text{ mg}$$

$$= 0,00317 \text{ gram}$$

- Formula 5 & 7

- HPMC 1,4 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{HPMC yang ditimbang} = 63,585 \infty x$$

$$4 \infty 1,4 \text{ mg}$$

$$4x = 89,019$$

$$x = \frac{89,019}{4} = 22,25475 \text{ mg}$$

$$= 0,0225 \text{ gram}$$

- Maltodextrin 0,6 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{maltodextrin yang ditimbang} = 63,585 \infty x$$

$$4 \infty 0,6 \text{ mg}$$

$$4x = 38,151$$

$$x = \frac{38,151}{4} = 9,53775 \text{ mg}$$

$$= 0,00953 \text{ gram}$$

- Formula 4

- HPMC 1,2 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{HPMC yang ditimbang} = 63,585 \infty x$$

$$4 \infty 1,2 \text{ mg}$$

$$4x = 76,302$$

$$x = \frac{76,302}{4} = 19,0755 \text{ mg}$$

$$= 0,0191 \text{ gram}$$

- Maltodextrin 0,8 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{maltodextrin yang ditimbang} = 63,585 \infty x$$

$$4 \infty 0,8 \text{ mg}$$

$$4x = 50,868$$

$$x = \frac{50,868}{4} = 12,717 \text{ mg}$$

$$= 0,0127 \text{ gram}$$

- Formula 6

- HPMC 1,6 mg

$$\text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} = 4 \text{ cm}^2$$

$$\text{HPMC yang ditimbang} = 63,585 \infty x$$

$$4 \infty 1,6 \text{ mg}$$

$$4x = 101,736$$

$$x = \frac{101,736}{4} = 25,434 \text{ mg}$$

$$= 0,0254 \text{ gram}$$

- Maltodextrin 0,4 mg

$$\begin{aligned}
 \text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} &= 4 \text{ cm}^2 \\
 \text{maltodextrin yang ditimbang} &= 63,585 \infty x \\
 &4 \infty 0,4 \text{ mg} \\
 4x &= 25,434 \\
 x &= \frac{25,434}{4} = 6,3585 \text{ mg} \\
 &= 0,00635 \text{ gram}
 \end{aligned}$$

#### h. Formula optimum HPMC dan Maltodextrin

- HPMC 1,70094 mg

$$\begin{aligned}
 \text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} &= 4 \text{ cm}^2 \\
 \text{HPMC yang ditimbang} &= 63,585 \infty x \\
 &4 \infty 1,70094 \text{ mg} \\
 4x &= 108,1542699 \\
 x &= \frac{108,1542699}{4} = 27,0386 \text{ mg} \\
 &= 0,0270 \text{ gram}
 \end{aligned}$$

- Maltodextrin 0,299 mg

$$\begin{aligned}
 \text{Dalam ukuran } 2 \text{ cm} \times 2 \text{ cm} &= 4 \text{ cm}^2 \\
 \text{maltodextrin yang ditimbang} &= 63,585 \infty x \\
 &4 \infty 0,299 \text{ mg} \\
 4x &= 19,011915 \\
 x &= \frac{19,011915}{4} = 4,75297 \text{ mg} \\
 &= 0,0048 \text{ gram}
 \end{aligned}$$

## Lampiran 16 hasil ANOVA uji sifat fisik

### 1. Uji ketebalan

#### ANOVA

ketebalan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,009	7	,001	2,610	,053
Within Groups	,008	16	,000		
Total	,017	23			

#### ketebalan

Tukey HSD<sup>a</sup>

formula	N	Subset for alpha = 0.05
		1
formula 2	3	,078667
formula 3	3	,078667
formula 8	3	,078667
formula 4	3	,082000
formula 6	3	,084000
formula 5	3	,099333
formula 1	3	,111333
formula 7	3	,135333
Sig.		,091

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.

### 2. Waktu hancur

#### ANOVA

waktu hancur

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	61,618	7	8,803	18,919	,000
Within Groups	7,445	16	,465		
Total	69,063	23			



**waktu hancur**Tukey HSD<sup>a</sup>

formula	N	Subset for alpha = 0.05			
		1	2	3	4
formula 5	3	24,343333			
formula 1	3	24,853333	24,853333		
formula 3	3		26,293333	26,293333	
formula 7	3		26,676667	26,676667	
formula 6	3			27,310000	
formula 4	3			27,656667	
formula 2	3			28,076667	28,076667
formula 8	3				29,600000
Sig.		,980	,071	,081	,181

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.

## 3. pH

**ANOVA**

pH

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,856	7	,122	,502	,820
Within Groups	3,901	16	,244		
Total	4,757	23			

**pH**Tukey HSD<sup>a</sup>

formula	N	Subset for alpha = 0.05
		1
formula 5	3	6,0233
formula 1	3	6,0667
formula 7	3	6,0967
formula 4	3	6,1833
formula 6	3	6,1933
formula 8	3	6,2367
formula 2	3	6,4900
formula 3	3	6,5867
Sig.		,846

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.

4. *Folding endurance***ANOVA**

folding\_endurance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1951,333	7	278,762	41,814	,000
Within Groups	106,667	16	6,667		
Total	2058,000	23			

**folding\_endurance**Tukey HSD<sup>a</sup>

formula	N	Subset for alpha = 0.05		
		1	2	3
formula 4	3	3,3333		
formula 3	3		17,6667	
formula 1	3		19,0000	
formula 2	3		19,0000	
formula 7	3		19,3333	
formula 5	3		21,0000	
formula 8	3		21,6667	
formula 6	3			39,0000
Sig.		1,000	,571	1,000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.

## 5. Uji disolusi

a. Q<sub>45</sub>**ANOVA**

uji_disolusi	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18219,283	7	2602,755	23538,673	,000
Within Groups	1,769	16	,111		
Total	18221,052	23			

**uji\_disolusi**Tukey HSD<sup>a</sup>

formula	N	Subset for alpha = 0.05						
		1	2	3	4	5	6	7
formula 3	3	91,481467						
formula 6	3	92,059667						
formula 1	3		95,246400					
formula 7	3			122,257533				
formula 8	3				128,611833			
formula 2	3					132,000100		
formula 5	3						153,512633	
formula 4	3							171,048500
Sig.		,438	1,000	1,000	1,000	1,000	1,000	1,000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.

b. DE<sub>45</sub>**ANOVA**

DE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	133,000	7	19,000	30,854	,000
Within Groups	9,853	16	,616		
Total	142,853	23			

**DE**Tukey HSD<sup>a</sup>

formula	N	Subset for alpha = 0.05		
		1	2	3
formula 1	3	11,831700		
formula 3	3	11,965533		
formula 6	3	12,353133		
formula 7	3	13,241167	13,241167	
formula 4	3		15,061467	
formula 5	3		15,240133	
formula 8	3			17,606867
formula 2	3			18,255700
Sig.		,400	,094	,966

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.