BAB V

KESIMPULAN DAN SARAN

A. KESIMPULAN

Berdasarkan penelitian yang telah dilakukan dapat disimpulkan bahwa kombinasi Avicel PH 101 dan PVP melalui *co-processing* dengan metode *spray drying* menghasilkan material *co-processed excipients* dengan sifat fisik yang sesuai untuk material kempa langsung. Material *co-processed excipients* kombinasi Avicel PH 101 dan PVP memenuhi syarat fluiditas dan kompaktibilitas. *Co-processing excipients* mampu memperbaiki sifat fisik eksipien tunggal sehingga mampu menjadi eksipien pilihan bagi metode kempa langsung.

Formula optimum dengan metode optimasi *Simplex Lattice Design* dari penelitian ini diperoleh pada perbandingan 95% Avicel PH 101 dan 5% PVP yang menunjukkan sifat material *co-processed excipients* dan sifat fisik tablet yang menurunkan waktu alir, kerapuhan dan waktu hancur tablet serta meningkatkan kompaktibilitas, kekerasan dan jumlah obat yang terdisolusi.

B. SARAN

Co-processed excipients campuran Avicel PH 101 dan PVP dapat digunakan sebagai *filler-binder* pada pembuatan tablet dengan zat aktif yang lebih larut dalam air.

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Lampiran

Lampiran 1. CoA Bahan Baku Asetosal

Novacyl

Manufacturing Plant
NOVACYL [illegible]
RUE PROSPER MONNET
[illegible] - SAINT FONS
FRANCE

NOVACYL SAS
29 AVENUE JOANNES MASSET
La Cam[illegible] Journée - CS 10615
69009 - LYON
FRANCE

Certificate of analysis

[illegible]
03.04.2012
Purchase order number/Date
PO # 1[illegible] / 14.03.2012
Delivery [illegible]/Date
8210[illegible] / 08.03.2012
Order [illegible]/Date
1317023 000010
Customer
70456
[illegible]
GROUPAGE[illegible]

PT KON MEX
DESA DANGDRAHAN, [illegible] GROGOL KAB SUKOHARJO
57102 SUKOHARJO / INDONESIA
INDONESIE

Attn:
FAX:

Material: Our / Your reference
11379 RHODINE 3[illegible] / ACETYLSALICYLIC ACID DRUM 50 KG / [illegible]
RHODIA PDS : 333 [illegible] RHO[illegible] - Dec 2010
NOVACYL PDS : ASA-[illegible]-EP-1110 V1

This product complies with the specifications of the current editions of USP and Ph.EUR.
Our Rhodine is periodically checked in microbiology by [illegible] of Lyon in accordance with the European Pharmacopeia.
This batch of Rhodine was manufactured in accordance with EU GMP Volume 4 Part II (ICH Q7) and with current [illegible] [illegible 1993-007] and [[illegible] N° 11379].
* Compliance guaranteed, skip testing.

Batch [illegible] / Manufacturing date: [illegible].2012 / Re Test date [illegible].2015
Quantity: 2,200 KG

Characteristic	Unit	Value	Lower Limit	Upper Limit
Identity Ph. Eur. / USP	-	Guaranteed conformity	-	-
Ethanolic sol.-colour Ph. Eur.	-	Liquid less coloured than Y9		-
Ethanolic sol.-turbidity Ph. Eur.	-	Clear	-	-
Loss on drying Ph. Eur.	%	0.01	-	0.50
Assay (on a dry basis) Ph. Eur.	%	100.[illegible]	99.5	101.0
Sulphated ash Ph. Eur. / USP	%	< 0.01	-	0.05
Heavy Metals * Ph. Eur. / USP	ppm	< 10	-	10

R[illegible]-CLR-2
1 [illegible].12.2011

Novacyl
Peace of Mind

Material: Our / Your reference
11079 RHODINE 3223 / ACETYLSALICYLIC ACID DRUM 50 KG /
RHODIA PDS : 230 FP RHO32213 - Dec 2010
NOVACYL PDS : [illegible]-FP-1110-V1
Batch PRH120531 / Manufacturing date 00.03.2012 / Re-Test date 05.03.2015 / Quantity 2,200 KG

Page
2

Anhydride of acetylsalicylic acid [illegible]	%	< 0.0300	-	0.1500
Acetylsalicylsalicylic acid [illegible]	%	< 0.0300	-	0.1500
Salicylsalicylic acid [illegible]	%	< 0.0300	-	0.1500
4-hydroxybenzoic acid [illegible]	%	< 0.0300	-	0.1500
4-hydroxyisophthalic acid [illegible]	%	< 0.0300	-	0.1500
Free salicylic acid [illegible]	%	< 0.0300	-	0.1500
Unspecified impurities>0.05% [illegible]	-	None	-	-
Sum of related substances [illegible]	%	< 0.0300	-	0.2500
Retained on 63 mu sieve [illegible]	%	38.7	0.0	70.0
Retained on 300 mu sieve	%	0.7	-	1.0

Batch released on 14.03.2012.
Person responsible for batch release: Gerard Cortes, QA Manager.

F0220-EUR-2
28.12.2011

Lampiran 2. Pemeriksaan sifat fisik dari material *co-processed excipients*

Formula		Uji Mutu Fisik Material *co-processed excipients*								
		Waktu alir (detik)	Sudut diam (^{o})	Kandungan Lembab (%)	Kompaktibilitas (kg)	Daya serap air (g/menit)	Berat Jenis Nyata	Berat Jenis Mampat	Indeks *carr (%)*	*Percent spray-dried yield* (%)
I		6,250	30,890	5,500	4,600	0,321	0,401	0,414	2,997	8,381
		6,660	30,350	6,000	5,000	0,254	0,409	0,422	3,000	
		6,830	30,300	5,500	5,000	0,278	0,406	0,414	2,001	
	π :	6,580	30,510	5,670	4,870	0,284	0,405	0,417	2,666	
	SD :	0,300	0,330	0,290	0,230	0,034	0,004	0,005	0,580	
II		7,490	29,660	6,000	6,600	0,202	0,405	0,418	2,994	5,836
		7,830	29,240	5,500	6,600	0,154	0,402	0,410	1,999	
		7,820	29,220	6,000	6,700	0,113	0,393	0,405	2,994	
	π :	7,710	29,370	5,830	6,630	0,156	0,400	0,411	2,662	
	SD :	0,190	0,250	0,290	0,060	0,045	0,006	0,006	0,580	
III		7,860	32,620	6,000	6,700	0,284	0,387	0,403	3,998	7,395
		7,340	30,770	6,000	6,700	0,260	0,394	0,406	2,994	
		7,860	33,230	6,000	6,800	0,133	0,404	0,416	2,993	
	π :	7,690	32,200	6,000	6,730	0,225	0,395	0,408	3,329	
	SD :	0,300	1,280	0,000	0,060	0,081	0,008	0,007	0,580	

Lampiran 3. Pemeriksaan keseragaman bobot tablet Asetosal dengan material *co-processed excipients*

Replikasi	Formula		
	I	II	III
1	0.1986	0.2011	0.2006
2	0.1981	0.2001	0.2005
3	0.1988	0.1995	0.1999
4	0.1982	0.1991	0.1995
5	0.1982	0.1983	0.2001
6	0.1984	0.1989	0.2001
7	0.1979	0.1996	0.2004
8	0.1985	0.1989	0.2005
9	0.1969	0.1998	0.1997
10	0.2000	0.1995	0.1996
11	0.1994	0.2013	0.2005
12	0.1984	0.2010	0.2002
13	0.1992	0.1992	0.1998
14	0.1978	0.1996	0.2004
15	0.1988	0.1998	0.2001
16	0.1971	0.1995	0.2004
17	0.1997	0.2004	0.1998
18	0.1979	0.2011	0.1999
19	0.1990	0.1994	0.1974
20	0.1916	0.2000	0.2003
Rata-rata (gram)	0.1981	0.1998	0.2000
SD	0,0017	0,0008	0,0007
CV (%)	0.9375	0.3468	0.2100

Perhitungan keseragaman bobot tablet Asetosal menurut Farmakope Indonesia edisi III

Formula I

Bobot rata-rata 20 tablet = 0,1981 gram

a. Penyimpangan 7,5% = $\frac{7,5}{100} \times 0,1981 \text{ gram} = 0,0149 \text{ gram}$

   Jadi berat tablet Asetosal 200 ± 14,9 mg (185,1 - 214,9 mg)

b. Penyimpangan 15% = $\frac{15}{100} \times 0,1981 \text{ gram} = 0,0297 \text{ gram}$

   Jadi berat tablet Asetosal 200 ± 29,7 mg (170,3 – 229,7 mg)

Formula II

Bobot rata-rata 20 tablet = 0,1998 gram

a. Penyimpangan 7,5% = $\frac{7,5}{100} \times 0,1998 \text{ gram} = 0,0150 \text{ gram}$

   Jadi berat tablet Asetosal 200 ± 15,0 mg (185 - 215 mg)

b. Penyimpangan 15% = $\frac{15}{100} \times 0,1998 \text{ gram} = 0,0300 \text{ gram}$

   Jadi berat tablet Asetosal 200 ± 30,0 mg (170 – 220 mg)

Formula III

Bobot rata-rata 20 tablet = 0,2000 gram

a. Penyimpangan 7,5% = $\frac{7,5}{100} \times 0,2000 \text{ gram} = 0,0150 \text{ gram}$

   Jadi berat tablet Asetosal 200 ± 15 mg (185 - 215 mg)

b. Penyimpangan 15% = $\frac{15}{100} \times 0,2000 \text{ gram} = 0,0300 \text{ gram}$

   Jadi berat tablet Asetosal 200 ± 30 mg (170 – 230 mg)

Lampiran 4. Pemeriksaan mutu fisik tablet Asetosal dengan material *co-processed excipients*

Formula		Uji Mutu Tablet Asetosal				
		Kekerasan (kg)	Kerapuhan			Waktu Hancur (menit)
			Berat Sebelum	Berat Sesudah	Kerapuhan (%)	
Formula I		5,300	3,964	3,938	0,653	1,817
		5,400	3,975	3,948	0,682	1,833
		5,400	3,971	3,945	0,673	1,517
	π :	5,367			0,669	1,722
	SD :	0,058			0,014	0,178
Formula II		8,400	3,995	3,975	0,496	8,567
		8,500	3,991	3,972	0,474	8,933
		8,600	4,018	3,999	0,463	8,833
	π :	8,500			0,478	8,778
	SD :	0,100			0,016	0,189
Formula III		8,200	4,002	3,981	0,535	4,333
		8,300	4,005	3,984	0,514	4,866
		8,300	4,021	3,999	0,547	4,583
	π :	8,267			0,532	4,594
	SD :	0,058			0,016	0,267

Lampiran 5. Pemeriksaan disolusi tablet Asetosal dengan material *co-processed excipients*

Formula I

Replikasi I dengan berat tablet 199 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.247	1	66.118	33.059	0.000	33.059	41.531
10	0.279	1	75.529	37.765	0.661	38.426	48.274
15	0.327	1	89.647	44.824	0.755	45.579	57.260
30	**0.489**	**1**	**137.294**	**68.647**	**0.896**	**69.544**	**87.366**
45	0.495	1	139.059	69.529	1.373	70.902	89.073
60	0.512	1	144.059	72.029	1.391	73.420	92.236

Replikasi II dengan berat tablet 199,3 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.197	1	51.412	25.706	0.000	25.706	32.245
10	0.286	1	77.588	38.794	0.514	39.308	49.308
15	0.367	1	101.412	50.706	0.776	51.482	64.578
30	**0.468**	**1**	**131.118**	**65.559**	**1.014**	**66.573**	**83.508**
45	0.487	1	136.706	68.353	1.311	69.664	87.386
60	0.499	1	140.235	70.118	1.367	71.485	89.670

Replikasi III dengan berat tablet 200,6 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.198	1	51.706	25.853	0.000	25.853	32.220
10	0.252	1	67.588	33.794	0.517	34.311	42.761
15	0.304	1	82.882	41.441	0.676	42.117	52.489
30	**0.453**	**1**	**126.706**	**63.353**	**0.829**	**64.182**	**79.987**
45	0.478	1	134.059	67.029	1.267	68.296	85.115
60	0.503	1	141.412	70.706	1.341	72.046	89.789

Formula II

Replikasi I dengan berat tablet 199,6 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.087	1	19.059	9.529	0.000	9.529	11.936
10	0.169	1	43.176	21.588	0.191	21.779	27.278
15	0.189	1	49.059	24.529	0.432	24.961	31.264
30	**0.285**	**1**	**77.294**	**38.647**	**0.491**	**39.138**	**49.020**
45	0.369	1	102.000	51.000	0.773	51.773	64.846
60	0.403	1	112.000	56.000	1.020	57.020	71.418

Replikasi II dengan berat tablet 198,5 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.081	1	17.294	8.647	0.000	8.647	10.891
10	0.161	1	40.824	20.412	0.173	20.585	25.925
15	0.182	1	47.000	23.500	0.408	23.908	30.111
30	**0.273**	**1**	**73.765**	**36.882**	**0.470**	**37.352**	**47.043**
45	0.342	1	94.059	47.029	0.738	47.767	60.160
60	0.414	1	115.235	57.618	0.941	58.558	73.751

Replikasi III dengan berat tablet 199,5 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.085	1	18.471	9.235	0.000	9.235	11.573
10	0.166	1	42.294	21.147	0.185	21.332	26.732
15	0.222	1	58.765	29.382	0.423	29.805	37.350
30	0.283	1	76.706	38.353	0.588	38.941	48.798
45	0.389	1	107.882	53.941	0.767	54.708	68.557
60	0.419	1	116.706	58.353	1.079	59.432	74.476

Formula III

Replikasi I dengan berat tablet 200,4 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.076	1	15.824	7.912	0.000	7.912	9.870
10	0.121	1	29.059	14.529	0.158	14.688	18.323
15	0.206	1	54.059	27.029	0.291	27.320	34.082
30	**0.367**	**1**	**101.412**	**50.706**	**0.541**	**51.246**	**63.930**
45	0.384	1	106.412	53.206	1.014	54.220	67.640
60	0.483	1	135.529	67.765	1.064	68.829	85.864

Replikasi II dengan berat tablet 200,3 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.054	1	9.353	4.676	0.000	4.676	5.837
10	0.110	1	25.824	12.912	0.094	13.005	16.232
15	0.254	1	68.176	34.088	0.258	34.346	42.869
30	**0.355**	**1**	**97.882**	**48.941**	**0.682**	**49.623**	**61.936**
45	0.383	1	106.118	53.059	0.979	54.038	67.446
60	0.440	1	122.882	61.441	1.061	62.502	78.011

Replikasi III dengan berat tablet 199,6 mg

Waktu (menit)	Absorbansi	FP	Konsentrasi (ppm)	Konsentrasi (mg/500ml)	Faktor Koreksi	Kadar + Faktor Koreksi	Kadar (%)
5	0.059	1	10.824	5.412	0.000	5.412	6.778
10	0.124	1	29.941	14.971	0.108	15.079	18.886
15	0.222	1	58.765	29.382	0.299	29.682	37.177
30	**0.332**	**1**	**91.118**	**45.559**	**0.588**	**46.146**	**57.799**
45	0.342	1	94.059	47.029	0.911	47.941	60.046
60	0.479	1	134.353	67.176	0.941	68.117	85.317

Lampiran 6. Hasil uji statistik dan persamaan berdasarkan *Simplex Lattice Design* dengan program *Design Expert 8,0,6*

Response 1 waktu alir
ANOVA for Quadratic Mixture Model
***** Mixture Component Coding is L_Pseudo. *****
Analysis of variance table [Partial sum of squares - Type III]

Sum of Squares	**df**	**Mean Square**	**F Value**	**p-value Prob > F**	**Source**
Model	0.84	2	0.42		
Linear Mixture	*0.62*	*1*	*0.62*		
AB	*0.22*	*1*	*0.22*		
Pure Error	0.000	0			
Cor Total	0.84	2			

Std. Dev.	R-Squared	1.0000	
Mean	7.33	Adj R-Squared	
C.V. %	Pred R-Squared	N/A	
PRESS	N/A	Adeq Precision	0.000

Case(s) with leverage of 1.0000: Pred R-Squared and PRESS statistic not defined
"Adeq Precision" measures the signal to noise ratio. A ratio of 0.00 indicates an inadequate signal and we should not use this model to navigate the design space.

Component	**Coefficient Estimate**	**df**	**Standard Error**	**95% CI Low**	**95% CI High**	**VIF**
A-Avicel	6.58	1				1.25
B-PVP	7.69	1				1.25
AB2.30	1				1.50	

Final Equation in Terms of L_Pseudo Components:
waktu alir =
+6.58 * A
+7.69 * B
+2.30 * A * B
Final Equation in Terms of Real Components:
waktu alir =
+5.58375 * Avicel
-1317.91625 * PVP
+1437.50000 * Avicel * PVP
Final Equation in Terms of Actual Components:
waktu alir =
+0.047724 * Avicel
-11.26424 * PVP
+0.10501 * Avicel * PVP

Response 2 kompaktibilitas
ANOVA for Quadratic Mixture Model
***** Mixture Component Coding is L_Pseudo. *****
Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F
Model	2.19	2	1.09		
Linear Mixture	1.73	1	1.73		
AB	0.46	1	0.46		
Pure Error	0.000	0			
Cor Total	2.19	2			
Std. Dev.			R-Squared	1.0000	
Mean	6.08		Adj R-Squared		
C.V. %			Pred R-Squared	N/A	
PRESS	N/A		Adeq Precision	0.000	

Case(s) with leverage of 1.0000: Pred R-Squared and PRESS statistic not defined
"Adeq Precision" measures the signal to noise ratio. A ratio of 0.00 indicates an inadequate signal and we should not use this model to navigate the design space.

Component	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
A-Avicel	4.87	1				1.25
B-PVP	6.73	1				1.25
AB3.32	1				1.50	

Final Equation in Terms of L_Pseudo Components:

kompaktibilitas =
+4.87 * A
+6.73 * B
+3.32 * A * B

Final Equation in Terms of Real Components:

kompaktibilitas =
+3.36750 * Avicel
-1900.63250 * PVP
+2075.00000 * Avicel * PVP

Final Equation in Terms of Actual Components:

kompaktibilitas =
+0.028782 * Avicel
-16.24472 * PVP
+0.15158 * Avicel * PVP

Response 3 kekerasan
ANOVA for Quadratic Mixture Model
***** Mixture Component Coding is L_Pseudo. *****
Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	df	Mean Square	F Value	p-value Prob > F
Model	6.09	2	3.04		
Linear Mixture	*4.20*	*1*	*4.20*		
AB	*1.88*	*1*	*1.88*		
Pure Error	0.000	0			
Cor Total	6.09	2			

Std. Dev.		R-Squared	1.0000
Mean	7.38	Adj R-Squared	
C.V. %		Pred R-Squared	N/A
PRESS	N/A	Adeq Precision	0.000

Case(s) with leverage of 1.0000: Pred R-Squared and PRESS statistic not defined
"Adeq Precision" measures the signal to noise ratio. A ratio of 0.00 indicates an inadequate signal and we should not use this model to navigate the design space.

Component	Coefficient Estimate	Standard df	95% CI Error	95% CI Low	95% CI High	VIF
A-Avicel	5.37	1				1.25
B-PVP	8.27	1				1.25
AB	6.72	1				1.50

Final Equation in Terms of L_Pseudo Components:

kekerasan =
+5.37 * A
+8.27 * B
+6.72 * A * B

Final Equation in Terms of Real Components:

kekerasan =
+2.54500 * Avicel
-3872.95500 * PVP
+4200.00000 * Avicel * PVP

Final Equation in Terms of Actual Components:

kekerasan =
+0.021752 * Avicel
-33.10218 * PVP
+0.30682 * Avicel * PVP

Response 4 kerapuhan
ANOVA for Quadratic Mixture Model
***** Mixture Component Coding is L_Pseudo. *****
Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	Mean df	F Square	p-value Value Prob > F
Model	0.019	2	9.700E-003	
Linear Mixture	*9.800E-003*	*1*	*9.800E-003*	
AB	*9.600E-003*	*1*	*9.600E-003*	
Pure Error	0.000	0		
Cor Total	0.019	2		

Std. Dev.		R-Squared	1.0000
Mean	0.56	Adj R-Squared	
C.V. %		Pred R-Squared	N/A
PRESS	N/A	Adeq Precision	0.000

Case(s) with leverage of 1.0000: Pred R-Squared and PRESS statistic not defined
"Adeq Precision" measures the signal to noise ratio. A ratio of 0.00 indicates an inadequate signal and we should not use this model to navigate the design space.

Component	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
A-Avicel	0.67	1				1.25
B-PVP	0.53	1				1.25
AB	-0.48	1				1.50

Final Equation in Terms of L_Pseudo Components:
kerapuhan =
+0.67 * A
+0.53 * B
-0.48 * A * B

Final Equation in Terms of Real Components:
kerapuhan =
+0.85500 * Avicel
+279.35500 * PVP
-300.00000 * Avicel * PVP

Final Equation in Terms of Actual Components:
kerapuhan =
+7.30769E-003 * Avicel
+2.38765 * PVP
-0.021915 * Avicel * PVP

Response 5 waktu hancur
ANOVA for Quadratic Mixture Model
***** Mixture Component Coding is L_Pseudo. *****
Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	Mean df	F Square	p-value Valu Prob > F
Model	25.20	2	12.60	
Linear Mixture	*4.15*	*1*	*4.15*	
AB	*21.06*	*1*	*21.06*	
Pure Error	0.000	0		
Cor Total	25.20	2		

Std. Dev.		R-Squared	1.0000
Mean	5.03	Adj R-Squared	
C.V. %		Pred R-Squared	N/A
PRESS	N/A	Adeq Precision	0.000

Case(s) with leverage of 1.0000: Pred R-Squared and PRESS statistic not defined
"Adeq Precision" measures the signal to noise ratio. A ratio of 0.00 indicates an inadequate signal and we should not use this model to navigate the design space.

Component	Coefficient Estimate	df	Standard Error	95% CI Low	95% CI High	VIF
A-Avicel	1.72	1				1.25
B-PVP4.60	1				1.25	
AB22.48	1				1.50	

Final Equation in Terms of L_Pseudo Components:
waktu hancur =
+1.72 * A
+4.60 * B
+22.48 * A * B

Final Equation in Terms of Real Components:
waktu hancur =
-6.02500 * Avicel
-13141.02500 * PVP
+14050.00000 * Avicel * PVP

Final Equation in Terms of Actual Components:
waktu hancur =
-0.051496 * Avicel
-112.31645 * PVP
+1.02637 * Avicel * PVP

Response 6 Q30
ANOVA for Quadratic Mixture Model
***** Mixture Component Coding is L_Pseudo. *****
Analysis of variance table [Partial sum of squares - Type III]

Source	Sum of Squares	Mean df	F Square	p-value Value Prob > F
Model	597.50	2	298.75	
Linear Mixture	*234.79*	*1*	*234.79*	
AB	*362.70*	*1*	*362.70*	
Pure Error	0.000	0		
Cor Total	597.50	2		

Std. Dev.		R-Squared	1.0000
Mean	65.73	Adj R-Squared	
C.V. %		Pred R-Squared	N/A
PRESS	N/A	Adeq Precision	0.000

Case(s) with leverage of 1.0000: Pred R-Squared and PRESS statistic not defined
Adeq Precision" measures the signal to noise ratio. A ratio of 0.00 indicates an inadequate signal and we should not use this model to navigate the design space.

Component	Coefficient Estimate	Standard df	95% CI Error	95% CI Low	95% CI High	VIF
A-Avicel	84.34	1				1.25
B-PVP	62.67	1				1.25
AB	-93.30	1				1.50

Final Equation in Terms of L_Pseudo Components:
Q30 =
+84.34 * A
+62.67 * B
-93.30 * A * B

Final Equation in Terms of Real Components:
Q30 =
+118.91375 * Avicel
+54390.91375 * PVP
-58312.50000 * Avicel * PVP

Final Equation in Terms of Actual Components:
Q30 =
+1.01636 * Avicel
+464.87960 * PVP
-4.25981 * Avicel * PVP

Lampiran 7. Alat *Spray dryer*

Lampiran 8. Gambar Avicel PH 101 dan PVP sebelum dan sesudah *co-processing excipients*

Sebelum *co-processing excipients* :

AVICEL PH 101

PVP

Sesudah *co-processing excipients* :

Material *co-processed excipients* campuran Avicel PH 101 dan PVP