OPTIMIZATION OF PARE (*Momordica charantia* L) FRUIT EXTRACT TABLETS BY DIRECT COMPRESSION WITH A COMBINATION OF AMPROTAB AND LACTOSE AS FILLING

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ABSTRACT

Bitter gourd is one of the fruits efficacious as an antidiabetic treatment. Amprotab and lactose are fillers of tablets. The filler in the tablet can affect the tablet so that an optimum formula is needed to make the bitter melon extract tablet that meets the requirements. The purpose of this study was to determine the optimum formulation of bitter melon extract tablets with a combination of amprotab and lactose fillers The method used in this research design is experimental quantitative with true experimental design posttest only control group design. *Simplex Lattice Design* (SLD) data analysis method. Tablets were made using the direct compression method. The results obtained. The results of the evaluation of the granules showed that each formulation complied with the requirements. The optimum formula of bitter melon extract tablets produced tablets that met all the requirements for tablet evaluation and data analysis of *Simplex Lattice Design* (SLD) by showing the same results, namely F1. The conclusion of this study is that the combination formula of Amprotab and Lactose in the tablet preparation of bitter melon extract can affect the characteristics of the tablet preparation of bitter melon extract based on the results of the evaluation of the physical properties of the tablet. The optimum formula is F1 obtained results that meet the requirements and the data analysis shows a desirability value of 0.7% which indicates the optimum formula

Keywords: Bitter gourd (Momordica charantia L), Filler, Lactose, Amprotab

1. Introduction

Medicinal preparations from natural ingredients are still widely used by the community and are proven to be able to heal based on hereditary experience. One fruit that has medicinal properties that is still often used as a treatment is bitter melon *(Momordica charantia* L*)*. Bitter gourd *(Momordica charantia* L*)* contains many chemicals in it, one of the chemicals contained in bitter melon are lectins, charantins, and polypeptide-P insulin which have been shown to reduce blood glucose levels (Adnyana *et al*., 2017). Tablets are preparations that are widely and often used by the public because tablets have several advantages, namely how to use them easily, dosage accuracy, storage is stable and cheaper than other drug dosage forms. The tablet manufacturing method used is direct compression because it uses fewer materials, compared to other methods, the manufacturing stage is

short, fast, simple and inexpensive only with conventional tablet printing equipment and has good flow properties and low content of active substances below 100 milligrams fits this method (Zaman & Sopyan, 2020).

In the process of making tablets by mixing the active substance and additives. One of the additives that need to be considered to produce good and quality tablets is the consistency of the filler. Fillers can affect the physical properties of tablet preparations, namely compactibility and compression (Syukri *et al*., 2018). In a previous study, using only a single filler, namely amprotab, the results showed that the flow time was longer, the tablet hardness was lower, the friability was greater, and the disintegration time was fast (Nurkhayatun, 2010). The advantage of Amprotab is that it is cheap. While the drawback is that it will reduce compressibility if the concentration is large, the flow properties are bad (Nurkhayatun, 2010).

One of the additives as a filler in tablets is lactose. Lactose is a filler that is often used because it is cheap and is an inert filler. Lactose in tablet formulations serves as a good filler because it can compact the granule mass in wet granulation or direct compression methods. Lactose can also accelerate the dissolution rate. In previous studies, it has been proven that the combination of lactose and amprotab fillers can be formulated in the manufacture of tablet preparations (Syukri *et al*., 2018).

Based on this background, this study combines lactose as a filler with amprotab in bitter melon extract tablets using the direct compression method. Based on the theory, the combination of additives will produce tablets that are of higher quality or quality than the use of a single additive, because previous researchers stated that with a single filler, amprotab, the results of the evaluation of tablets did not meet the requirements. Therefore, it is necessary to combine excipients to increase compactibility and compression in tablet preparations which are expected to get the right formulation to produce tablets that meet the requirements.

Problem Formulation

The formulation of the problem in the research that this study wants to observe by knowing the results include:

1. How is the effect of the combination of lactose and amprotab as a filler?
2. What is the optimal formulation of several bitter melon extract formulations using the Simplex Lattice Design (SLD) method?

Research Objectives

This research aims as follows:

1. To determine the effect of the combination of lactose and amprotab as a filler.
2. To determine the optimal formulation of bitter melon extract tablets using the *Simplex Lattice Design* (SLD) method.

Research Benefits

The benefits that will be obtained from this research are divided into two parts, namely academic and practical benefits as follows:

1. For researchers

   This research can be used for academic science, namely improving knowledge in the field of pharmacy in the field of pharmaceutical technology regarding the formulation of bitter melon fruit extract tablets with a combination of fillers.

2. For education

   The practical benefits of the results of this research are for educational institutions to be able to develop the field of pharmaceutical technolog

2. Materials and Method

Materials

The materials used in this study were Bitter melon Extract, Avicel pH 102, Primojel, Amprotab, Lactose, Talcum, and Magnesium Stearate. The tools used in this research are glassware (measuring beakers, beakers, test tubes, analytical balances, sieves, mortars and stampers, single punch tablet presses, tapping tools, Granule Flow Tester GFT-100 -AU), Hardness Tester, Friability Tester TFT-2-D, and Disintegration Tester TDT-2-IM.

Methods

The research method in this study uses experimental quantitative research by describing the variables in this study and using data, namely numbers. This type of research is to see or find out the results of research in the form of numbers. The research design used is True Experimental, where the variables can be controlled and can perform randomization in the sampling of this study. The design in this study was a posttest only control group design with bitter melon extract as the research subject, group A was treated with a bitter melon extract tablet formulation with an intervention of various filler combinations and for group B as a control, the bitter melon extract tablet formulation with a single filler . After that, both were carried out post-test, namely by evaluating the results of making tablets.

Table 1. Pare (Momordica charantia L) Fruit Extract Tablet Formulation (Puspita Septie Dianita, 2016)

No	Ingredients	Formula (mg)				
		Control I	Control II	1	2	3
1	Pare Fruit Extract	30	30	30	30	30
2	Avicel pH 102	118,75	118,75	118,75	118,75	118,75
3	Primojel	32,5	32,5	32,5	32,5	32,5
4	Amprotab	279,75	-	139,81	119,86	109,88
5	Laktosa	-	279,75	139,94	159,89	169,87
6	Talkum	13	13	13	13	13
7	Magnesium Stearat	26	26	26	26	26
	Total	500	500	500	500	500

Work procedures

his research has a working procedure for making tablets by the direct compression method as follows:

A. How to make granules

1. Prepare mortar and stamper
2. Weigh the active substance of bitter melon extract (30 mg) in each formulation on the analytical balance
3. Weigh Avicel pH 102 (48.75 mg) of each formulation on the analytical balance
4. Weigh Amprotab (99.75 mg), formula 1 (49.875 mg), formula 2 (29.925 mg), and formula 3 (19.95 mg) on the analytical balance
5. Weigh Lactose (99.75 mg), formula 1 (50 mg), formula 2 (69.95 mg), and formula 3 (79.925mg) on the analytical balance
6. Put the dried extract of bitter melon into a mortar that has been finely ground first
7. Add amprotab and lactose into the mortar until it is homogeneous
8. Add avicel pH 102 binder to the above mixture little by little until a good powder is formed
9. Weigh the Talcum (13 mg) of each formulation on the analytical balance
10. Weigh Magnesium Stearate (26 mg) of each formulation on analytical balance
11. Weigh Primojel (32.5 mg) of each formulation on the analytical balance
12. Add the powder mixture, add lubricating talc and magnesium stearate, and grind primojel crusher until homogeneous.

B. Granule Evaluation

1. Flow property test
2. Test angle of repose
3. Compressibility test

C. how to make tablets

Enter the granules that have been evaluated for their flow properties, then put them in a direct compression device and press tablets.

D. Tablets Evaluation

1. Organoleptic
2. Hardness Test
3. Weight uniformity test
4. Fragility test
5. Disintegrate time test

Evaluation of granules

A. Flow rate test

Good flow properties are 10 grams/second (Appriliani *et al*., 2021)

Table 2. Flow Time Requirements (Aeni, 2016)

Value (grams/second)	Flow Properties
>10	Free Flow
4-10	Easy Flow
1,6-4	Cohesive
<1,6	Very Cohesive

B. Angle of repose test

Granules that can meet the requirements by having a repose angle of 25^{o} to 30^{o} (Appriliani *et al*., 2021)

C. Compressibility Test

According to granule requirements for compressibility with good flowability is less than 20% (Appriliani *et al*., 2021).

Table 3. Conditions for Compressibility Test (Aeni, 2016)

Compressibility (%)	Flow Criteria
5-12	Very well
12-16	Well
18-21	Enough
23-35	Bad
38-38	Very bad
>40	Very-Very Bad

Evaluation of table

A. Weight Uniformity Test

Weight uniformity test by weighing as many as 20 tablets from each formulation that has been printed and calculate the average weight. If weighing the preparations one by one, there should be no more than two tablets that deviate from the average weight that has been set in column A and there may not be any tablet whose weight deviates from the average weight in column B which must comply with the conditions that have been set (Wicjaksono, 2020).

Weight uniformity test requirements for the deviation of the average weight on the tablet:

Table 4. Terms of Deviation of Average Weight of Tablets (Aeni, 2016)

Average Weight (mg)	Deviation Average Weight (%)	
	A	B
25 mg or less	15 %	30 %
26 mg to 150 mg	10 %	20 %
151 mg to 300 mg	7,5 %	15 %
More than 300 mg	5 %	10 %

B. Hardness Test

The results of tablet hardness are measured on a kilogram scale on the test equipment when the tablet breaks, with a good tablet hardness requirement of a minimum of 4 kilograms and a maximum of 10 kilograms per tablet (Kusuma & Prabandari, 2020).

C. Fragility Test

The fragility of tablets using the uncoated direct compression method meets the requirements for the friability test if the weight loss from this test is less than 0.5% to 1% (Wicjaksono, 2020).

D. Destroyed Time Test

The results of the disintegration time test on uncoated tablets so that they can meet the requirements must be crushed in no more than 15 minutes (Wicjaksono, 2020).

E. Organoleptic Test

This test was conducted to determine the shape, smell and taste of bitter melon extract tablets.

3. Results and Discussio

Evaluation of granule

A. Flow rate test

Table 5. Granule Flow Rate

Formula	Average Flow Rate (seconds)
Control I	2,3 second
Control II	2,3 second
1	2 second
2	2 second
3	2,3 second

Information :

Control I	:	Pare fruit extract tablet formula with Amprotab
Control II	:	Bitter gourd extract tablet formula with Lactose
F1	:	Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (50%: 50%)
F2	:	Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (30% : 70%)
F3	:	Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (20%: 80%)

The results of the research that has been carried out on each formulation with the same total granule weight of 25 grams, the results obtained are Control I 2.3 seconds, Control II 2.3 seconds, F1 2 seconds, F2 2 seconds and F3 2.3 seconds. Based on the results obtained, it shows that the most ideal flow rates are at F1 and F2 where the faster the flow rate in the granules, the better the flow properties.

The standard parameter of the flow properties test on granules is 10 grams/second (Appriliani *et al*., 2021). The results of this study are in line with research conducted by (Khaidir *et al*., 2015)on the results of the five formulations that have been tested showing varying results which can be caused by differences in the granule surface of each formulation and varying amounts of fillers. factors that can affect the flow properties of the granules, but still within the required limit of 10 grams/second having good flow properties (Appriliani *et al*., 2021). This is due to the influence of

lactose and amprotab as fillers which have material properties that can increase the flow properties of the granules. The faster the flow rate in the granules, the better the flow properties. The evaluation results showed that the five formulations met the flow rate test requirements, namely that each granule weighed 25 grams/2 seconds so that it could be printed into the tablet machine.

B. Angle Of Repose Test

Table 6. granule angle of repose

Formula	Average Angle of Recess (°)
Control I	27 °
Control II	24 °
1	25 °
2	27 °
3	28 °

Information :

Control I : Pare fruit extract tablet formula with Amprotab
Control II : Bitter gourd extract tablet formula with Lactose
F1 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (50%: 50%)
F2 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (30% : 70%)
F3 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (20%: 80%)

The results of the research that has been carried out on the angle of repose test showed that each formulation was Control I 27°, Control II 24°, F1 25°, F2 27° and F3 28°. Based on the results obtained, it shows that the most ideal flow rate is in Control II where the smaller the angle of repose produced in the granules, the better the flow properties.

According to the granule requirements for the angle of repose is 25° to 30° (Appriliani *et al*., 2021). The results of this study are in line with research conducted by (Khaidir *et al*., 2015)on the evaluation of the angle of repose of the five formulations showing results between 25 ° to 30 ° that meet the requirements with good flow properties. Based on the results obtained in Control II is the most ideal result due to the influence of fillers, namely Control II only uses a single Lactose concentration, where the nature of the lactose can improve the flow properties of a granule. The smaller the angle of repose produced, the better the flow properties. The angle of repose is also affected by the size of the friction and attraction between the particles. If the friction and attraction between the particles are small, the granules will flow more easily and faster so that the angle of repose formed is getting smaller (Khaidir *et al*., 2015).

C. Compressibility Test

Table 7. granule compressibility

Formula	Average Compressibility (%)
Control I	15 %
Control II	12 %
1	11,83 %
2	11,63 %
3	13,30 %

Information :

Control I	:	Pare fruit extract tablet formula with Amprotab
Control II	:	Bitter gourd extract tablet formula with Lactose
F1	:	Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (50%: 50%)
F2	:	Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (30% : 70%)
F3	:	Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (20%: 80%)

The results of the research that has been carried out on the compressibility test showed that each formulation was Control I 15%, Control II 12%, F1 11.83%, F2 11.63% and F3 13.30%. Based on the results obtained, it shows that the most ideal flow rate is at F2 where the smaller the percentage of compressibility produced in the granules, the better the flow properties. A small compressibility index value indicates that the granules do not provide a large volume reduction (Khaidir *et al*., 2015).

According to the granule requirements for compressibility with good flowability is less than 20% (Appriliani *et al*., 2021). The results of this study are in line with the research conducted by (Appriliani *et al*., 2021) on the evaluation of the compressibility of the five formulations, which showed that less than 20% had met the requirements for granules with good flow properties. Good flow properties are influenced by the filler material. Lactose has good compactibility and will make strong particle bonds. Compressibility is also influenced by the flow properties of a granule, the smaller the compressibility value, the better the flow properties (Khaidir *et al*., 2015).

Evaluation of tablet

A. Organoleptic Test

Table 8. Organoleptic Pare Fruit Extract Tablets

No	Formula	Physical Form	Color	Odor	Taste
1	Control I	Flat Round	Light brown	Special aroma extract	Bit bitter
2	Control II	Flat Round	Light brown	Special aroma extract	Bit bitter
3	Formula 1	Flat Round	Light brown	Special aroma extract	Bit bitter
4	Formula 2	Flat Round	Light brown	Special aroma extract	Bit bitter
5	Formula 3	Flat Round	Light brown	Special aroma extract	Bit bitter

This test is an initial introduction to the evaluation of the physical properties of tablets. This organoleptic examination was carried out using the five senses to describe the shape, color, smell and taste of the extract. The general appearance of a tablet is very important for consumers and also in order to control the uniformity between ingredients. The color of the resulting tablet must be even and uniform, otherwise it can cause loss of aesthetic value and can cause consumer distrust of the uniformity of content and low quality of the resulting tablet. The resulting bitter melon extract tablets have uniform physical characteristics, namely flat round shape, not cracked and light brown in color, this color comes from a mixture of colors of dried bitter melon extract

and other additives. The odor of the tablet is a characteristic odor of the extract and has a slightly bitter taste.

B. Hardness Test

Table 9. Hardness of Bitter melon Extract Tablet

Formula	Average Hardness (Kg)
Control I	4,2 kg
Control II	4,8 kg
1	5 kg
2	6 kg
3	5,75 kg

Information :

Control I : Pare fruit extract tablet formula with Amprotab
Control II : Bitter gourd extract tablet formula with Lactose
F1 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (50%: 50%)
F2 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (30% : 70%)
F3 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (20%: 80%)

The results of the research that has been carried out on the hardness test showed that each formulation was Control I 4.2 kg, Control II 4.8 kg, F1 5 kg, F2 6 kg and F3 5.75 kg. Based on the results obtained, it shows that the most ideal tablet hardness is at F1 because it has the most ideal range in tablet requirements. If the tablet is too hard then the tablet will affect the disintegration time, whereas if the tablet is too weak then the tablet becomes brittle or cannot stand during the manufacturing process.

According to the requirements of the physical properties of tablets for a good tablet hardness is 4 kg to 10 kg (Kusuma & Prabandari, 2020). The results of this study are in line with research conducted by (Kusuma & Prabandari, 2020) on the evaluation of the hardness of the five formulations showing results that meet the tablet hardness requirements, namely in the range of 4 kg-10 kg. The hardness of a tablet is affected by the pressure during the tablet molding process. The greater the pressure applied to the tablet, the higher the tablet hardness will be. There are several factors that can affect the hardness of a tablet, namely compression pressure and the nature of the material being compressed, such as tablets that are too smooth due to insufficient compression pressure or lack of binder. Compression pressure is related to hardness, i.e. the greater the pressure applied during tablet compression, the higher the tablet hardness. The difference in flow properties causes the five formulations to have different compression pressures so that varying hardness is obtained. In tablet hardness will be related to brittleness and disintegration time. The higher the hardness, the lower the brittleness of the tablet, while the higher the hardness of the tablet, the higher or longer the disintegration time of the drug (Khaidir *et al*., 2015).

C. Weight Uniformity Test

Table 10. Weight Uniformity of Bitter melon Extract Tablet

Formula	Average (g)	Lower Limit A (5%) (g)	Upper Limit A (5%) (g)	Lower Limit B (10%) (g)	Upper Limit B (10%) (g)
Control I	0,49	0,47	0,51	0,44	0,54
Control II	0,49	0,47	0,51	0,44	0,54
1	0,49	0,47	0,51	0,44	0,54
2	0,49	0,47	0,51	0,44	0,54
3	0,48	0,45	0,50	0,43	0,52

Information :

Control I : Pare fruit extract tablet formula with Amprotab
Control II : Bitter gourd extract tablet formula with Lactose
F1 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (50%: 50%)
F2 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (30% : 70%)
F3 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (20%: 80%)

From the data on the uniformity of the weight of 20 tablets in each formula, with an average weight of 500 mg, the weight is included in the category of weight > 300 mg, i.e. no more than 2 tablets, each of which deviates from the average weight which is greater than 5% and there should be no tablet whose weight deviates from the average weight by more than 10% (Appriliani *et al*., 2021). The results of the evaluation of the weight uniformity of the five formulations showed results that met the requirements for weight uniformity.

Weight uniformity can indicate that the particle size distribution of the ingredients contained in the tablet is homogeneous. The discrepancy that can occur in the tablets produced after the weight uniformity test is caused by the non-uniformity of filling the granules to be compressed to become tablets, which is also related to the flow properties of the granules (Appriliani *et al*., 2021).

D. Friability Test

Table 11. Brittleness of bitter melon fruit extract tablets

Formula	Fragility (%)
Control I	1,60 %
Control II	1,24 %
1	0,82 %
2	1,41 %
3	1,22 %

Information :

Control I : Pare fruit extract tablet formula with Amprotab
Control II : Bitter gourd extract tablet formula with Lactose
F1 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (50%: 50%)
F2 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (30% : 70%)
F3 : Pare fruit extract tablet formula with a combination of Amprotab and Lactose levels (20%: 80%)

The results of the research that has been carried out on the friability test obtained the results of each formulation namely Control 1.60%, Control II 1.24%, F1 0.82%, F2 1.41% and F3 1.22%. Based on the results obtained, it shows that good tablet friability is only F1 because the smaller the friability value obtained, the smaller the lost tablet mass. According to the tablet physical properties requirements for a good tablet friability is not more than 1% (Kusuma & Prabandari, 2020). The greater the friability value obtained, the greater the lost tablet mass. This friability test is related to the loss of weight due to erosion on the tablet surface. Fragility with a high percentage will affect the concentration or level of the active substance contained in the tablet (Khaidir *et al*., 2015).

The results of this study are in line with the research conducted by (Kusuma & Prabandari, 2020) on tablets that have a friability value of less than 1% are tablets that meet the requirements, in this study only F1 met the requirements because it used a combination of amprotab and lactose as a filler material. balanced with a concentration of 50%: 50%. The fillers of amprotab and lactose can affect the friability of the resulting tablet, the greater the levels of lactose and amprotab in the formula mixture, the stronger the particle bond, resulting in a decrease in the friability of the tablet. The discrepancy that can occur in tablet fragility is caused by tablets that are not compressed properly. Brittleness can also be affected from the compression process given during tablet compression where the higher the pressure applied, the smaller the resulting tablet brittleness, whereas if the pressure applied is small on compression, the resulting tablet is less brittle. friability of the tablets is high (Appriliani *et al*., 2021). The friability of tablets will be related to hardness and disintegration time. The higher the hardness, the lower the brittleness of the tablet, and the higher the hardness of the tablet, the higher or longer the drug disintegration time (Khaidir *et al*., 2015).

E. Destroyed Time Test

Table 12 Crushing Time Pare Fruit Extract Tablets

Formula	Shatter Time (Minutes)
Control I	6 minutes
Control II	8 minutes
1	6 minutes
2	8 minutes
3	6 minutes

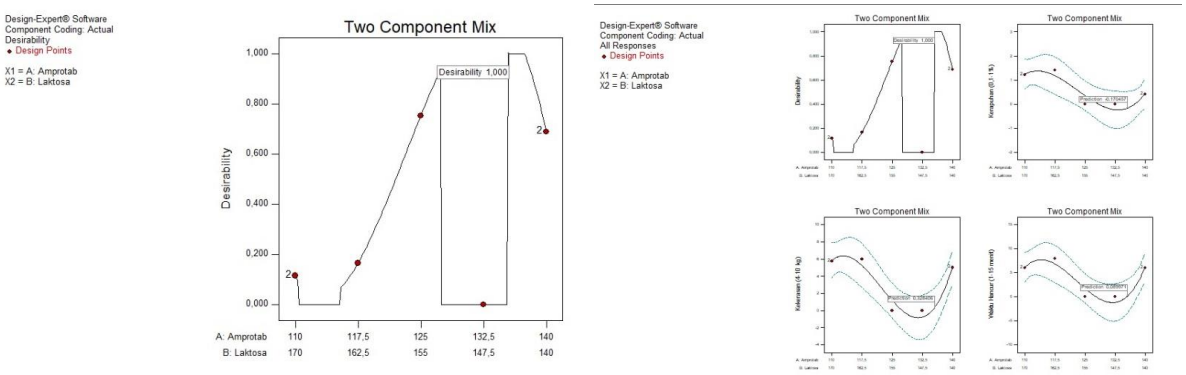
The results of the research that has been carried out on the disintegration time test obtained the results of each formulation, namely Control I 6 minutes, Control II 8 minutes, F1 6 minutes, F2 8 minutes and F3 6 minutes. Based on the results obtained, it shows that the ideal tablet disintegration time is Control I, F1 and F3 where the faster the disintegration time is obtained, the faster the dissolution of the active substance so that it will have a faster effect in the body.

According to the requirements for the physical properties of tablets, the disintegration time for uncoated tablets is less than 15 minutes (Kusuma & Prabandari, 2020). The faster the disintegration time is obtained, the faster the dissolution of the active substance will be so that it

will have a faster effect in the body. The greater the amount of water that enters the pores of the tablet, the tablet will disintegrate quickly (Khaidir *et al*., 2015)

The results of this study are in line with the research conducted by (Kusuma & Prabandari, 2020) on the evaluation of the disintegration time of the five formulations showing results that meet the disintegration time requirements of tablets. Filler amprotab and lactose can affect the disintegration time in decreasing disintegration time. Amprotab will expand due to a liquid entering the tablet, this action will counteract the action of the binder and this action will help the development of several components that will help disintegrate the tablet. The results obtained were due to Avicel pH 102 as a binder and primojel as a disintegrant which had high effectiveness so that the disintegration time obtained was effective and fast. The factors that affect the disintegration time are the binding agent and the disintegrating agent. In the presence of a disintegrating agent that is evenly mixed in the tablet, it causes the tablet to expand and the constituents of the tablet are pressed and the tablet is crushed in water or gastric juice. The disintegration time of the tablet is also related to the hardness of the tablet. The discrepancy that can occur in the tablet disintegration time test can also be caused by tablet hardness, if the higher the tablet hardness, the higher or longer drug disintegration time (Khaidir *et al.*, 2015)

Simplex Lattice Design (SLD) Data Analysis



Based on the results of data analysis using Design Expert software using the Simplex Lattice Design (SLD) method to obtain the optimum formulation. The optimum formula is a formula that has the evaluation results within the range of limits in each parameter by using the degree of desirability, that is, a value close to 1 is the optimum formula. The data from the evaluation of the physical properties of tablets, namely hardness, friability and disintegration time for each formula were entered into the data analysis, then the optimal formula results were obtained at F1 with a desirability value of 0.7 where the desirability value was closest to 1. Based on the results of the data analysis, it showed The results are the same as the evaluation of the physical properties of tablets, which is that F1 is the optimum formula.

4. Conclusion

Based on the results of the research that has been carried out, it can be concluded that the use of fillers, namely Amprotab and Lactose in combination in the preparation of bitter melon extract tablets can affect the characteristics of the bitter melon extract tablet preparation based on the results of the evaluation of the physical properties of the tablets which include organoleptic, hardness, weight uniformity, friability and time. destroyed. Based on the results of tablet evaluation and data analysis, it can be concluded that the optimum formula is F1 because all tablet evaluations obtained results that meet the requirements and the data analysis shows a desirability value of 0.7% which indicates the optimum formula

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