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RESEARCH IN THE FIELD OF CHOOSING THE OPTIMAL COMPOSITION AND TECHNOLOGY OF FURFENZOLE TABLETS

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Abstract: The article provides research on the study of the comparative technological properties of objects of research and the Prussian mass of the recommended Pillets of the Furuffenzole antifung.

Keywords: technological properties, tablets, object, pressed mass, composition, technology

INTRODUCTION

The pharmaceutical industry is one of the most important sectors of the country's economy, which includes the need to further increase the investment attractiveness of the industry. Especially for innovative projects, research research and laboratory research in the development of new effective drugs and drugs based on the domestic resource base [10].

Political transformations, changes on the economic map of the world, global geophysical and environmental processes, significant socio -economic changes, and, finally, the overall tendency to increase health costs require modern effective approaches to creating new and reproduction of well -known drugs [9].

Improving the development of the composition and technology of the production of drugs of well -known drugs in order to optimize their biopharmaceutical factors: effectiveness, safety, comfort, stability is an urgent problem [5,9,10].

The World Health Organization has determined the following basic requirements for drugs in modern conditions: efficiency, safety and accessibility for the population that determine their expediency and the possibility of effective use in medical practice [3].

Despite the volumes of medicines that are growing from year to year in Uzbekistan, the most important pharmacotherapy groups, the need for domestic health care for high -quality drugs with proper bioavailability and safety is still not fully satisfied, especially in new generation preparations related to the necessary and important drugs [1.5,6].

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Thus, the creation of convenient in use, which have sufficient biological availability and stability in storage of dosage forms, is an urgent issue of pharmacy.

The above facts confirm the relevance of the development of new and improvement of existing antifungal drugs.

The purpose of this study is to study the main technological criteria for the composition and technology of combined antifungal tablets.

MATERIALS AND METHODS

The object of the study Fluconazole, Ibuprofen and Furozolidon.

From these literature, research in the field of pressing of various materials showed that the parameters of the technological process, as well as the properties of finished products, depend on the entire complex of physicochemical and technological properties of the source materials. The tablet mass has individual technological properties, the correct accounting of which ultimately ensures the receipt of the necessary quality indicators of finished products. Physico-chemical indicators affect the technological properties of powdered medicinal substances. To optimize tablet production, the study of the relationship between the physico-chemical and technological properties of the tablet materials, justification of approaches to the choice of optimal excipients and the technological scheme of tableting is important [2.7,9].

Based on this, for the further development of the tablet dosage form, we studied such technological properties as the shape and size of particles, fractional composition, bulk density, make -up, angle of natural sloping, pressability, sealing, porosity, residual humidity, moisture -grains of substance. The determination of these parameters was carried out in accordance with the methods of GF XI and the corresponding NTD.

According to organoleptic analysis, the substances of fluconazole, ibuprofen and furosolidone are crystalline amorphous powders: fluconazole-antifungal agent, white or almost white powder, ibuprofen non-steroid anti-inflammatory agent, white or almost white powder, furosolidon, bacteriostatic, antimicrobial agent, yellow or green -yellow -colored powder.

RESULTS AND DISCUSSION

To determine the fractional composition, a special set of 5 sieves located on the other was used, with a diameter of holes 3, 2, 1, 500 and 25 mm. The exact hitch of the substance (100 g) was placed on the upper sieve with a dimeter of holes of 2 mm. The whole set was shook on the vibrator for 5 minutes. Then Sita alternately removed and weighed their contents, finding the percentage of each fraction.

The research data is presented in Fig. 1.

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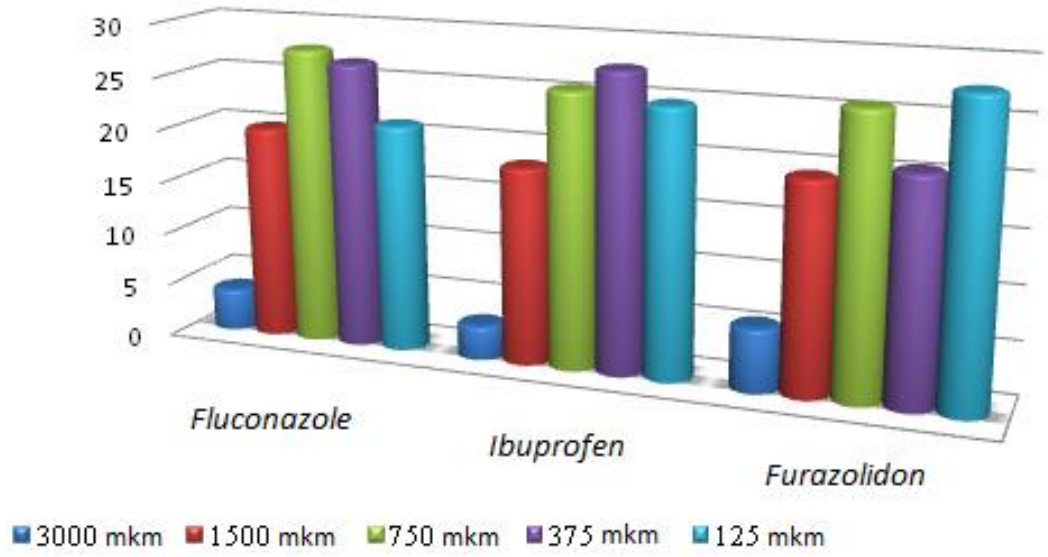

Fig. 1. The average size of the particles of the objects of the studied objects

According to the table, the substance is crystalline powders. The results of the fractional composition indicate that the average size of the particles of the fraction of the studied objects are distributed in the range from 750 to -250 microns.

Of the received data 27.79, 25.68 % and 25.92 (respectively), particles of all objects have an average size of 750 microns, a slightly smaller amount of 26.76, 27.75 and 20.79 %- 325 microns. Objects in size 125 are distributed 21.32, 24.93 and 27.76%, respectively.

The data of the fractional and microscopic analysis of the studied substances are shown in Fig. 2.

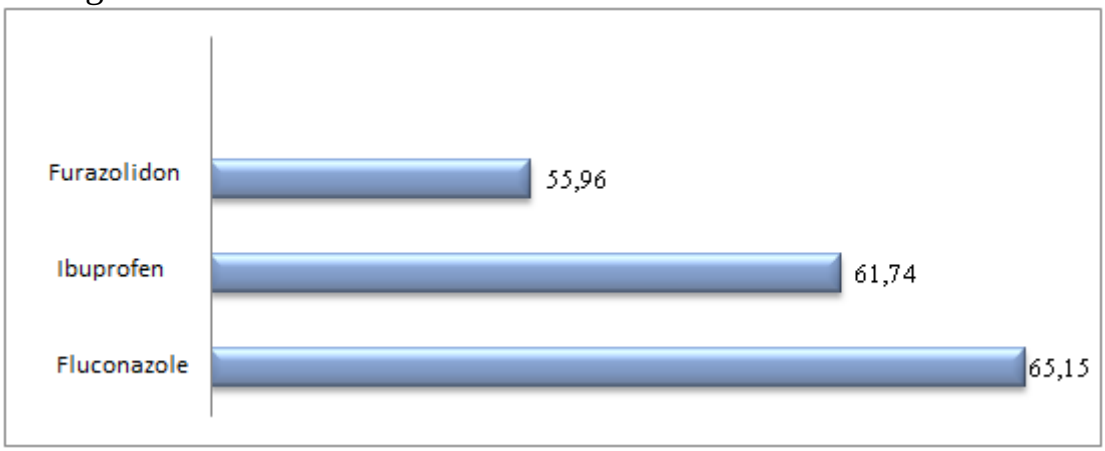

Fig. 2. The ratio of medium sizes of fraction particles studied objects

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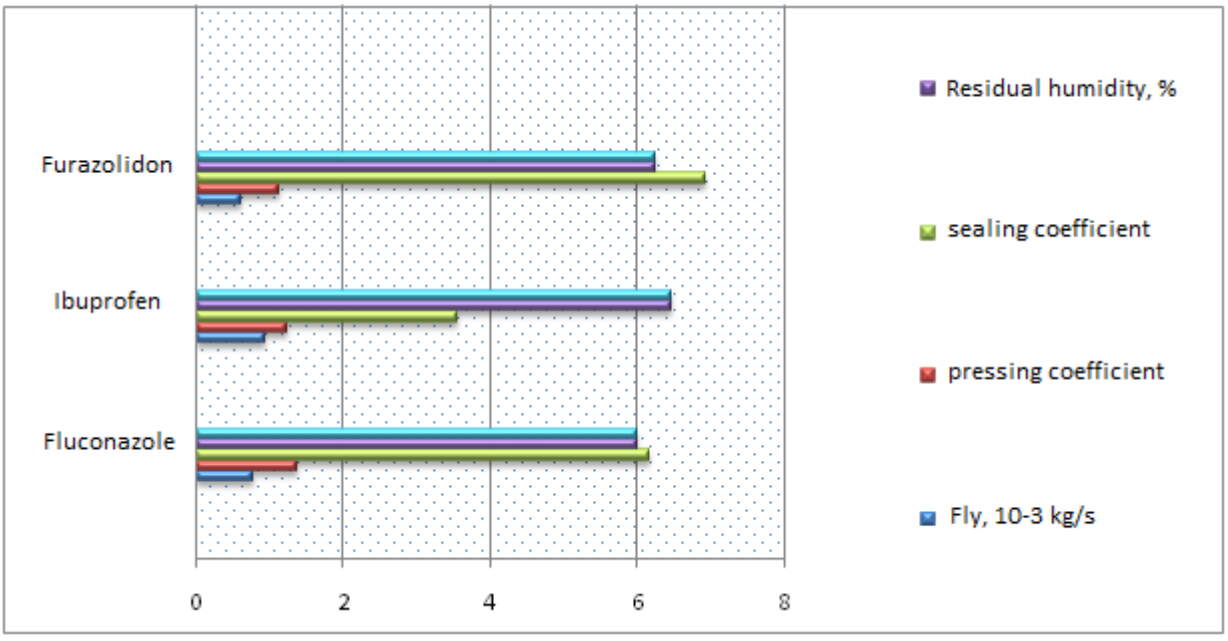
As technological indicators, the bulk density, fever, the angle of natural slope, porosity, coefficient of sealing and pressing, pressability and residual humidity were studied. The determination of these parameters was carried out in accordance with the methods of GF XIII and the corresponding NTD.

Research results are presented in table 1 and more clearly in Fig. 3.

Table 1

The results of the study of the technological parameters of the studied substances

dy parameters	Name of the substance		
	Fluconazole	Ibuprofen	Furazolidon
	0,765±0,038	0,040±0,015	0,602±0,021
	310,32±11,11	396,01±12,12	242,26±15,40
e, degree	52,15±0,86	60,45±2,01	55,29±1,54
	58	67	74
	1,37±0,012	1,22±0,07	1,11±0,017
ling	6,15±0,023	3,54±0,068	6,92±0,051
	84,89±1,32	74,08±1,12	80,65±0,92
	5,98±3,01	0,45±2,7	6,23±1,57



A

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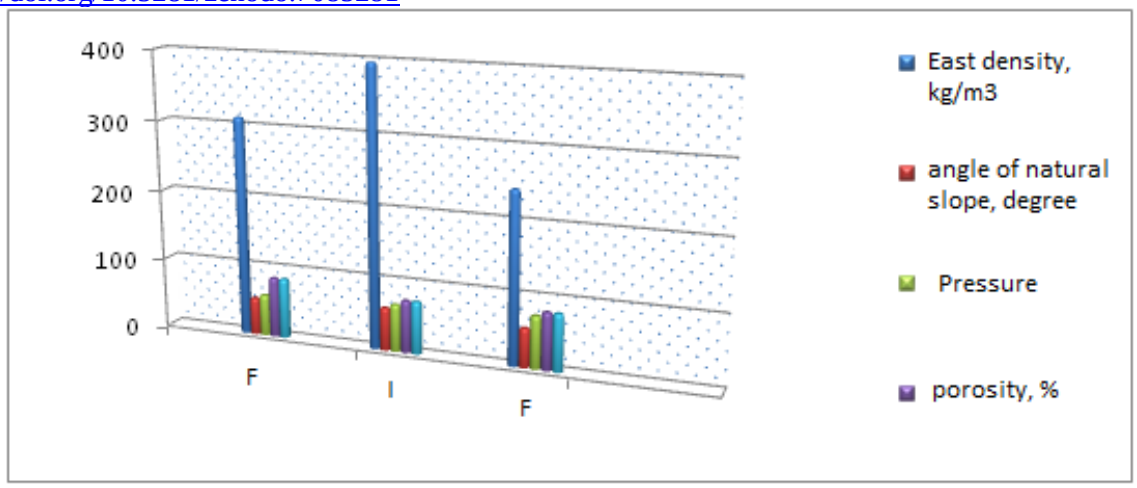

B

Fig. 3. Comparative data of the technological parameters (A and B) of the studied substances

According to the obtained data, the studied substances are characterized by unsatisfactory feuds (from 0.602 to 0.940*10^{-3} kg/s), bulk density (from 242.26 to 396.01 kg/m^3), and the angle of natural slop (from 52.15 to 60 to 60 to 60 to 60 , 45 degrees), an increased value of residual humidity (from 5.98 to 6.94%) and porosity (from 74.08 to 84.89%).

As a result of numerous studies of the substances of fluconazole, ibuprofen and furosolidone, including organoleptic, structural-mechanical and technological properties, it was established that to obtain tablet dosage forms, it is necessary to use a whole complex of excipients (fillers, binding, antifriction, etc.), as well as a method of wet Grauling.

According to data obtained in the study of structural-mechanical, technological indicators of the substances of fluconazole, ibuprofen and furosolidon, it was revealed that they have moderate hygroscopicity, high dispersion, unsatisfactory technological indicators of feud, porosity, and the angle of natural slop.

Thus, it is not possible to obtain a tablet form of the studied substances by direct pressing, as a result of which it was decided to use the method of wet granular and the introduction to the tablet masses of the complex of excipients.

To develop tablets, we have tested compositions with various compositions of excipients and their ratios. It should be noted that when obtaining tablets with a slight content of pharmacologically active substance, the main attention should be drawn to the choice of filler. The main requirements for this group of excipients are: stability

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during storage, good pressability, the ability to quickly and completely release the active substance and form strong tablets.

Given this circumstance, as well as the economic side of the issue, they used: sucrose, lactose, sodium bicarbonate, calcium carbonate, glucose, potato starch, microcrystalline cellulose, and other substances, both separately and in various combinations. As binders, 2-10% starch clayer, 1-3% gels of microcrystalline cellulose, 30, 50, 60, 70, 90, 96% ethyl alcohol and water is purified, and as anti-infrication-magnesium stabe, stearic acid and calcium stearate.

Table 2 shows 5 copies of the closest in composition of recommended tablets differing in the ratio of excipients.

Table 2

Recommended compositions of Furfenzole tablets

Ingredients	Composition compositions				
	FF - №1	FF- №2	FF - №3	FF - №4	FF - №5
Fluconazole	0,1	0,1	0,1	0,1	0,1
Iburofen	0,2	0,2	0,2	0,2	0,2
Furozolidon	0,075	0,075	0,075	0,075	0,075
Sucrose	0,078				
Lactose			0,078		
MCC		0,039			
Potato starch	0,050	0,050		0,050	
Povidon to 30		0,019			
Silicon dioxide colloidal		0,012	0,012		
Magnesium stearat	0,005	0,005			
Stearic acid					0,005
Calcium stearat			0,005		
The average mass	0,5	0,5	0,5	0,5	0,5
Binder	5% starch braister	7% starch braister	40% ethyl spirt	90% ethyl spire	Purified water

All the presented compositions after mixing and granular were subjected to studying the technological properties.

The data obtained are given in table. 3

Table 3

The results of a comparative study of the technological indicators of the studied substance, compositional mixtures and granular tablet masses

Name of tablet	Study parameters

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masses		Flying, 10^{-3} kg/s	East density, kg/m^3	Angle of natural slope, degree	Pressure n	Residual humidity, %	Sealing coefficient
Studied substances	Fluconazole	0,8 ±0,05	310,32±11,11	52,15±0,86	58	5,98±3,01	6,2±0,02
	Ibuprofen	0,9 ±0,02	396,01±12,12	60,45±2,01	67	6,45±2,7	3,5±0,07
	Furazolidon	0,6 ±0,02	242,26±15,40	55,29±1,54	74	6,23±1,57	6,9±0,05
Compositional mixtures	FF-№1	4,9±0,32	479,43±5,76	59,33±2,48	38	2,95±5,87	4,2±4,23
	FF-№2	4,2±2,11	499,65±3,39	59,24±1,09	35	2,98±2,97	5,1±2,68
	FF-№3	5,1±2,78	512,16±3,17	58,94±2,65	33	2,54±3,97	5,6±3,65
	FF-№4	4,4±2,53	508,94±2,56	54,87±2,27	33	2,47±3,65	4,7±2,45
	FF-№5	5,5±1,76	495,43±2,67	53,65±3,06	39	2,43±2,58	3,9±3,44
Granular tablet masses	FF-№1	5,8±0,76	528,53±5,87	55,98±1,22	43	3,11±3,54	2,7±2,11
	FF-№2	6,5±0,15	510,53±4,25	52,15±0,86	45	3,58±2,42	2,5±1,05
	FF-№3	5,1±2,43	478,84±2,98	45,87±3,12	47	2,99±4,76	3,1±3,66
	FF-№4	6,2±1,76	495,99±3,54	49,93±2,98	46	3,87±3,21	3,4±2,75
	FF-№5	5,5±1,68	505,53±3,54	47,49±2,45	43	3,97±3,65	2,9±2,11

According to the table, you can trace the improvement of the technological properties of the pressed masses in comparison with such substance and mixtures of the composition. So, for example, there is a significant increase in the feud of the granular pressed mass in comparison with substances (from 0.6-0.9 • 10^{-3} kg/s) of the substance and from the mixtures of the composition and mixtures of the composition (from 4.4-5.5 • 10^{-3} kg/s) increased (5.5-6.5 • 10^{-3} kg/s). During the mixtures of the composition, also the indicators of feuds of comparatively substances increased.

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The bulk density of the pressed masses increased by 1.3, 1.5 and 1.87 times compared to the initial values. The value of the sealing coefficient decreased from 6.9 ± 0.05 to 2.5 ± 1.05 (on average in substances 6.9 ± 0.05 to 3.5 ± 0.07 and in mixtures of the composition, on average from 3.9 ± 3.443DO5.6 ± 3.65).

Also, according to the above indicators, table 3 can be seen close to all compositions.

The obtained positive indicators of technological parameters are a confirmation of the validity of the choice of a complex of excipients and the technological process of obtaining tablets.

The next stage of the study were dedicated to the analysis of pills obtained according to these compositions. Analyzes were carried out according to the following indicators: appearance, average mass and deviations, disintegration, strength for a fragment and abrasion.

Studies of the above parameters were carried out in accordance with the generally accepted methods given in the XIII GF.

The results obtained are given in table 4.

Table 4

The results of the analysis of Furfenzole tablets

Recording		Analyzed indicators				
		Appearance	Deviations from the average mass, g	Disability, min	Strength on	
					abrasion, %	Break, n
Compositions	FF-№1	Yellow tablets with whole edges	0,494±2,5	15	95,54	60
	FF-№2	-//-	0,501±2,2	9	98,35	66
	FF-№3	-//-	0,502±3,1	16	97,26	48
	FF-№4	-//-	0,501±2,3	15	92,71	74
	FF-№5	-//-	0,499±2,7	15	93,23	55

According to the data obtained, all the tablets obtained according to experimental prescriptions, according to appearance, the average mass and deviations from it, as well as strength at the curtain, meet the requirements for regulatory and technical documentation. However, the tablets on the FF-1 and FF-No. 5 record did

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not fit into permissible limits according to the indicators of the decay, i.e. They were within 15 minutes. Also, this indicator according to the FF -4, showed 15 minutes, and in terms of strength for abrasion on these tablets (FF - No. 1, No. 4 and No. 5) were unsatisfactory - 95.54, 92.71 and 93.23, respectively. For other indicators, the obtained tablets for all compositions met the requirements for tablet drugs.

Thus, the Furfenzole tablets obtained by the FF-No. 2 written in the determined characteristics turned out to be satisfactory.

Given the foregoing, for further research the composition was selected according to the FF-No. 2.

The technology for obtaining Furfenzol tablets according to the selected composition (FF-№2) is as follows: pre-chopped and sifted through a sieve with a diameter of the holes of 150 mkm, the substance of fluconazole, ibuprofen and furosolidone and excipients are thoroughly mixed, moistened with 7% starchy clayer. The wet mass is dried at 40-500C to optimal residual humidity. Next, the mass is passed through a sieve with a diameter of holes of 0.1 mm and the finished granules are published by magnesium stearate. After studying the technological properties, the resulting mass is pressed into tablets with an average weight of 0.5g in a matrix with a diameter of 12 mm at a pressure of 100-160mpa.

The technological scheme for obtaining recommended Furfenzol tablets obtained by FF-No. 2 of the composition is shown in Fig. 4.

In all obtained tablets, the following indicators were determined: appearance, deviations from the average mass, disintegration, abrasion and break strength. The definition was carried out according to the methods of GF XIII.

The results of the study are given in table 5.

The strength of the abrasion of almost all experimental tablets, with the exception of the compositions of the FF-No. 1 and FF-No. 3, meets the requirements of the SCF of the XIII publication and is 97.96-99.55%. Deviations from the average mass in all analyzed compounds were within acceptable limits and did not exceed 5%.

According to the results of the analysis of the tablets, the use of 5% starch clayer and the water of the purified as grancing agents led to the obtaining tablets that do not meet the requirements of the XF XIII for decay. The exception was the prescription FF-No. 4, the disintegration in this case was 15 minutes. However, the strength of the abrasion of tablets of this composition was less than 97%.

More favorably affected the process of granular mass than the use of 7% ethyl alcohol.

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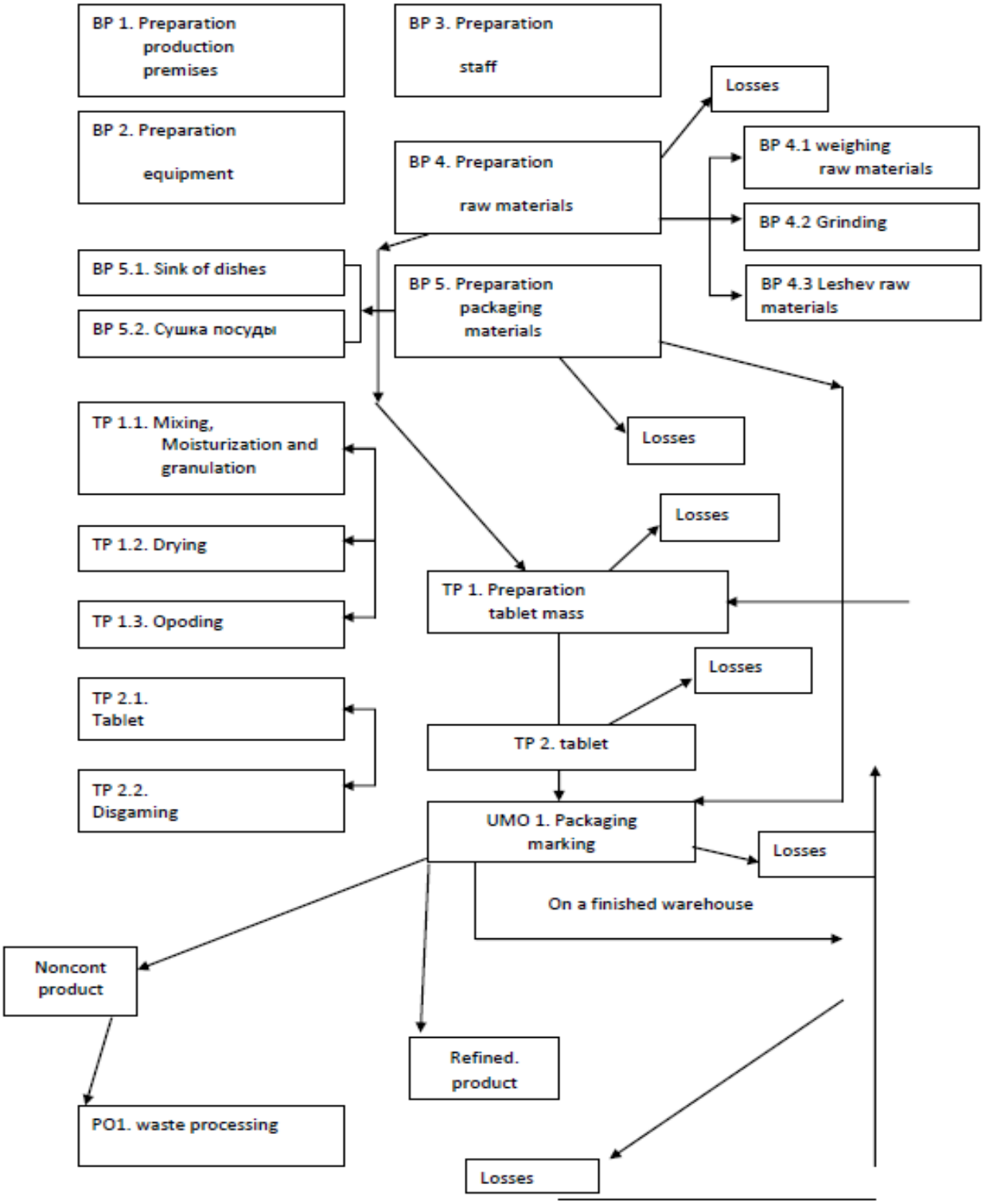

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Technological scheme for the production of recommended Furfenzole tablets

Thus, for further research, the tablets obtained according to the FF-No. 2 recording are recommended.

CONCLUSION

Thus, the optimal composition has been selected and the rational technology of combined Furfenzole tablets meets, which meets the requirements for quality indicators presented by GF XIII and the corresponding NTD.

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