



# **TECHNICAL UNIVERSITY OF THE NORTH**

**ABILITY OF ENGINEERING IN APPLIED SCIENCES  
CAREER OF ENGINEERING IN TEXTILE DESIGN AND FASHION**

**PREVIOUS WORK OF GRADE TO THE OBTAINING OF THE  
TITLE DE INGENIERA IN TEXTILE DESIGN AND FASHION**

**FEAR:**

**I DESIGN AND ELABORATION OF you SHOW WITNESS IN  
CLOTH OF COTTON 100%, USING THE LIVED CABBAGE IN  
THE PROCESS OF LAUNDRY to MEASURE THE PH OF THE  
CAUSING GARMENTS OF BABY OF THE ALLERGIES.**

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6010 years ago, nothing else and anything less than the Egyptians and the Sumerians invented the soap. From then on, the laundry of clothes advanced very little, until last century the industrial elaboration of synthetic detergents began.

The success of the detergent at world level was firm, becoming the precursor of a great quantity of detergents for multiple and varied applications.

For this reason you leave in the necessity of the investigation to see that pH has the clothes of he/she drinks to the moment of the term of the laundry process for the prevention of the causing allergies of some detergents.

## **CHAPTER I**

The cotton plants belong to the called genus *Gossypium* with around 40 species of bushes of the family of the Malvaceae one, originating of the regions tropical and subtropical part of the Old World like of the new one.

In their wild state, the plants can grow more than 3 m. The leaves are wide with 3 or 5 lobes (sometimes even seven). The seeds are contained in a capsule called bagá and each one surrounded by a hairy fiber called shred.

The cotton also requires great quantity of water in comparison with other cultivations.

### **1.1 History.**

The production of cotton fabrics you began to carry out in the area of the Indostán from the most remote antiquity. In time that wrote in the year

443 adC, the Indians took all cotton dresses. The Greek historian says:

They possess kind of a plant that, instead of fruit, it produces wool of a more beautiful quality and better than that of the rams: of her the Indians make their dresses.

#### **1.1.1 Africa.**

The cultivation of the algodonero and the production of you stew them of cotton they were established, in an old time and probably for the Muslims, in all the parts of Africa, located in the north of the Ecuador.

#### **1.1.2 America.**

When the discovery of the New World, the production of the cotton fabrics had already arrived in this continent to a high grade of perfection and the Mexicans knitted with this matter their main dresses since they lacked wool, of hemp, of silk and they were not served as the linen that however grew in that country.

#### **1.1.3 Europa**

If Europa is the part of the world where the art of manufacturing cotton has penetrated later, it is in revenge that where the genius made him make quick progresses.

### **1.2 Cotton Cultivation.**

The cotton was cultivated for thousands of years in the Peru Incan pre and they highlight the famous ones textile of the Culture Paracas so valued in diverse museums of the world.

### **Floor**

Although the cotton can be cultivated in a great variety of floors, it grows better in the deep, loose, with good content of matter organic and good capacity of retention of humidity. The very sandy floors give low yields.

The industry of the cotton uses a great quantity of chemical (fertilizers, insecticides, etc.), contaminating the environment. Due to this some farmers are opting for the organic production pattern.

50% of the cotton comes from the four countries with more production: China, India, EE. UU. And Pakistan.

### 1.2.1 Desmote of the cotton.

The modern desmote of the cotton is a continuous process that begins with the reception of the raw cotton, and it finishes with the packing of the fibers of the processed cotton.

### 1.3 World production of the cotton fiber.

Country world Production of cotton fiber (Tons)

	EFFECTIVE		FORE SEEN	RATES OF GROWTH	
	Pro medio 1989 - 1991	Pro medio 1999 - 2001		2010	1989 - 1991
				19	19
				89	99
				-	-
				91	20
				a	01
				19	a
				99	20
				-	10
				20	
				01	

	thousands of tons			annual percentage	
	19	19	23	0,4	1,5
<b>WORLD</b>	<b>030</b>	<b>901</b>	<b>095</b>		
<b>IN DEVELOPMENT</b>	<b>12</b>	<b>13</b>	<b>16</b>	<b>0,6</b>	<b>2,1</b>
	<b>382</b>	<b>099</b>	<b>160</b>		
<i>ÁFRICA</i>	811	1	1 740	4,6	3,2
		275			
Benin	59	157	200	10,3	2,4
Burkina Faso	69	127	200	6,2	4,6
Malí	109	180	300	5,1	5,2
Zimbabwe	53	116	150	8,1	2,6
LATIN AMERICA	1	1	1 453	-	2,1
	657	186		3,3	
Argentina	275	121	100	-	-
				7,8	1,9
Brasil	683	796	1 000	1,5	2,3
Colombia	131	29	40	-	3,4
				14,	
				1	
México	174	100	80	-	-
				5,4	2,2
Paraguay	200	79	150	-	6,6
				8,8	
NEAR EAST	1	1	1 757	2,7	0,4
	292	688			
Egipto	291	252	250	-	-
				1,4	0,1
Siria	154	336	250	8,1	-
					2,9
Turquía	611	857	1 000	3,4	1,6
DISTANT EAST	8	8	11 210	0,4	2,3
	619	946			
China	4	4	6 100	-	3,0
	656	523		0,3	
India	2	2	3 000	1,7	1,8
	117	513			
Pakistán	1	1	2 000	0,3	1,0
	758	803			

<b>DEVELOPED</b>	<b>6 648</b>	<b>6 803</b>	<b>6 935</b>	<b>0,2</b>	<b>0,2</b>
AMERICA OF THE NORTH	3 289	3 952	4 200	1,9	0,6
Estados Unidos	3 289	3 952	4 200	1,9	0,6
<i>EUROPA OCCIDENTAL</i>	304	533	300	5,8	- 5,6
ORIENTAL EUROPE and the former USSR	2 557	1 538	1 635	- 5,0	0,6
<i>OCEANÍA</i>	416	730	750	5,8	0,3
Australia	416	730	550	5,8	- 2,8
OTHER COUNTRIES					
<b>DEVELOPED</b>	<b>83</b>	<b>49</b>	<b>50</b>	<b>- 5,1</b>	<b>0,1</b>
Israel	40	21	15	- 6,3	- 3,3
Sudáfrica	43	28	35	- 4,1	2,1

#### 1.4 Composition.

Pure cellulose.....	91,5%
Composition water.....	7,5%
Matters nitrogenadas.....	0,5%
Fat and zero.....	0,3%
Mineral matters.....	0,2%

#### 1.5 Characteristics.

1 Common name: Cotton.

2. It names scientific:

Gossypiumherbaceum (Indian cotton),  
Gossypium

3. Barbadense (Egyptian cotton),  
Gossypiumhirstium (American cotton).

4. Class: Angiosperms

5. Sub Class: Dicotyledoneous

6. Order: Malvales

7. Family: Malvaceus.

8. Gender: Gossypium.

High to be able to hydrophilic

. Comfort in the use

It absorbs the perspiration

#### 1.6 Physical and Chemical properties.

##### Physical properties.

##### PHYSICAL PROPERTIES OF THE COTTON

- The longitude of the fiber
- The fineness of the fibers
- The cleaning
- The softness
- The color
- The resistance

##### THE LONGITUDE OF THE COTTON

Smaller very short fiber to 19 mm

Short fiber 20.6 - 28,6 mm

Half fiber 23,8 - 28,6

Long fiber 28,6 - 35 mm

Extra fiber releases bigger to 35 mm

##### THE FINENESS OF THE COTTON

## **CHAPTER II**

### **2 DETERGENT.**

#### **2.1 Detergents.**

Detergent is a substance tensioactiva that has the chemical property of dissolving the dirt or the sludges of an object without eating away it.

The equivalent English word is detergent. The term German employee is since tensid that seems more precise, he/she makes direct reference to its properties physical-chemistry.

#### **2.2 Properties.**

The detergents have multiple specific properties as:

- Humectation.
- . – Penetration.
- . - Emulsion.
- . – Suspension.

##### **2.2.1 Applications.**

- \* For the clothes
- \* For carpets
- \* For laundries of cars.
- \* For industrial and hospital use.

##### **2.2.2 Cautions.**

The detergents to wash clothes are extremely basic.

Not to aspire them because they can cause damages in the breathing roads.

To maintain far from the children.

Not to ingest.

In the event of accidental ingestion to go to a medical center with the label.

#### **2.3 Soap.**

The soap is a solid, powdered or liquid substance elaborated with the purpose of cleaning the surface of some dirty material.

#### **2.4 difference between soap and detergent**

The hard soaps are manufactured with oils and fatty that contain a high percentage of saturated acids, those which you saponifican with hydroxide of sodium

The detergents, on the other hand, are a mixture of several substances.

##### **2.4.1 Classification**

- \* Powdered detergents
- \* Liquid detergents
- \* Detergents in pills

##### **2.5 Functions.**

The detergents are compound that they allow to vary the superficial tension of the water and they are causing of the Humectation, Penetration, Emulsion and suspension of the dirt.

##### **2.6 Chemical Composition.**

The composition of the detergents can sound to Chinese. However, their more common elements have some very clear functions.

Tensioactivos

They are the active elements that really clean the clothes.

Fosfatos/Zeolitas

They are coayudantes that you/they help to that the tensioactivos is distributed in an uniform way by the water and to that remain more time in contact with the dirt.

Enzymes

They help to break and to crumble the matter that forms the stains so that they are eliminated with more easiness.

Fosfonatos

They are good for potential and to improve the action of the blanqueantes.

Blanqueantes based on the oxygen

The products that whiten the clothes. These ingredients liberate oxygen to eliminate the most tenacious stains and to assure this way the hygiene of the laundry.

## **2.7 Characteristics.**

The detergents have the following ones characteristic:

- They are soluble in water
- They have a kindred part to the fats
- They are able to eliminate stains
- They don't have scent

## CHAPTER III

### 3 Mordant.

The term "mordant" it comes from the Latin verb "I will bite" that means to bite in the sense of to seize or to notice a thing.

#### 3.1 Crémor Tartar.

The crémor tartar (sour tartar of potassium), it is the natural sour salt of some fruits, the main of them it is the grape.

#### 3.2 Composition

**Physical state:** Solid crystalline

**Color:** Blanco

**Relative density:** 1,984 g/cm<sup>3</sup> (18 °C)

**Solubility:** Soluble in

**Scent:** Toilet. It dilutes hot, insoluble in alcohol.

#### 3.3 Origin and Synthesis.

The bitartrato of potassium crystallizes in the casks of wines during the fermentation of the juice of grapes, and they can throw of the wine in the bottles.

#### 3.4 Applications.

THE CREMOR TARTAR IS USED AS CONCENTRATION IN THE FOLLOWING THING

- The stabilization of the egg white, increasing their tolerance to the heat and volume;
- To prevent from crystallization to the syrups of sugar;
- Reduction of the fading of boiled vegetables;
- Frequent combination with bicarbonate of sodium (which needs a sour ingredient to activate it) in the powder formulations of baking.
- It is usually used in combination with chloride of potassium in substitutes of the salt free of sodium.
- Glazed in the houses of bread of ginger.
- Glaseado en las casas de pan de jengibre.

#### 3.5 Properties.

The crémor tartar is presented in form of glasses or I eat powder white toilet, not very soluble in water and little hygroscopic, he/she has a flavor weakly sour pleasant frutado.

#### 3.6 Chemical data.

The crémor tartar is the basic sour salt whose formula is:

RHC<sub>4</sub>H<sub>4</sub>O<sub>6</sub>

I weigh Molecular - 188

Point of Coalition - 185°C

pH of Solution Saturated 3.5 Units

SOLUBILITY IN WATER

At 15°C - 0.6%

To 94° C - 6.2%

### **Specification.**

Appearance Glass or white powder

PURITY (As THK 101.0% máx.)

9.0 MINIMUM%

Lost in drying 0.5% maxim

Chlorides 183 ppm máx.

### **3.7 Uses.**

**A) I Use foods in the industry of the panificación.**

**B) I Use industrial.**

The tártaroemérico is used as mordant to fix basic colors in cotton, leather and skins.

**C) I Use pharmacists.**

## CHAPTER IV

### 4 LIVED CABBAGE.

The **Lombard cabbage** or **lived cabbage** is it would originate of the Mediterranean area. The history points out that it was cultivated by the Egyptians 2500 years before Christ and later on for the Greeks.

The Lombard cabbage is in the market during the months of winter.

#### 4.1 Chemical Composition.

It dilutes 91%

Hydrates of carbon 5% (fiber 1%)

Proteins 2, 6%

Lipids 0,2%

Potassium 210 mg/100 g

Sodium 28 mg/100 g

Match 23 mg/100 g

Calcium 42 mg/100 g

Iron 5 mg/100 g

Vitamin C 46 mg/100 g

Vitamin TO 6 mg/100 g

#### 4.2 Cultivation.

Their cultivation is relatively easy, he/she adapts to almost all type of floors, provided good presence of organic matter exists (HUMUS).

#### 4.3 Plagues and illnesses

Caterpillar of the cabbage.

- Plant lice.

- Gray worms.

- Weevil of the cabbages.

- Hernia or foal of the cabbages.

#### 4.4 Conservation.

Their conservation in the drawer of the vegetables of the refrigerator and wrapped in a bag of perforated plastic it is the most appropriate way to stay in perfect state in the home during 2-3 weeks.

#### 4.5 Uses.

- As ph indicator.
- 1La cabbage is extremely important from the medicinal point of view because of its wealth in vitamins and mineral salts.
- As caustic in the bronchitis.
- For their consumption.
- For their consumption.

## CHAPTER V

### 5 PH.

#### 5.1 Definition.

The term of pH value comes from Latin. He/she means pondushydrogenii weight of hydrogen. Another possible explanation of the meaning is potentiahydrogenii = effectiveness of the hydrogen.

The numbers starting from the 0 at the 7 in the scale indicate the sour solutions, and 7 at 14 they indicate alkaline solutions.

#### 5.2 Characteristics.

The meter of resistant pH to the water detects in a quick and precise way the value pH and the temperature.

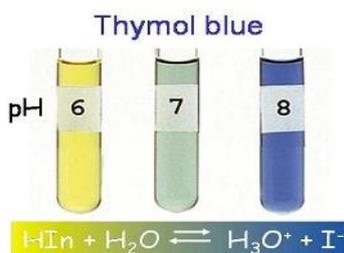
The pH is a factor very important, because certain chemical processes they can only take place to a certain pH.

The pH is an indicator of the acidity of a substance.

#### 5.3 Methods.

Several different methods exist to measure the pH.

#### Indicator in breakup



#### Indicative paper.



#### PH-meter.



## CHAPTER VI

### 6 The babies' allergies.

Group of alterations of breathing, nervous or eruptive character that take place in the immunologic system for a carried to an extreme sensibility from the organism to certain substances to those that has been exposed, and that under normal conditions they don't cause those alterations.

#### 6.1 Types of allergies.

##### 6.1.1 Allergy to foods.

Near the population's apparent allergy 15% or intolerance to certain types of food.

##### 6.1.2 Allergy to the pollen.

Also well-known as "fever of the hay", the allergy to the pollen is manifested with rinitis (sneezes, nasal secretion, picor, nasal congestion), and in occasions also with conjunctivitis (I shed tears and ocular picor).

##### 6.1.3 Allergy to the acari of the powder.

The expression common of "allergy to the powder" it is properly translated as "allergy to the acari of the powder."

##### 6.1.4 Allergy prurigo for insects or popular urticaria

\* It is presented in children between 1 and 7 years. It is a reaction from the skin to stings of insects like they are fleas, bedbugs, moscos and ticks.

##### 6.1.5 Allergy to the animals.

The derived substances of the hair and the skin of the animals can cause important allergies.

##### 6.1.6 Chemical substances.

Some products of beauty and some detergents for the clothes cause in some people eruptions associated to picor (ronchas).

The detergent for the clothes is a common culprit; without knowing it, we can be allergic to the chemists that contain. The substances with which we wash the clothes they can cause itch in the skin, urticaria and eruptions.

#### 6.2 Causes.

The allergies are presented when the system inmunitario reacts from an exaggerated way to substances (alérgenos) that are usually inoffensive, they cause ronchas and eruptions, the same as other symptoms. The graveness of the symptoms varies from a person to another.

#### 6.3 Treatment

The allergies can be overcome with the time, mainly in the case of allergies to certain foods, but the common thing is that once a sensibility is manifested toward some alérgeno this it continues affecting the person during all its life. Nevertheless, all the allergies can be treated practically with medications.

The best and only treatment for the allergy to these products of cleaning is to avoid the contact with them.

Products of cleaning that it is necessary to avoid

- Products detergents, disinfectant:

The tense contained assets in the detergents and other products

#### **6.4 Prevention**

The evitación can also help to protect the you not drink of the allergens alimentary or chemical. In fact, in some cases, to avoid to be exposed to the alérgeno is him only necessary treatment to prevent the allergic symptoms, without it is necessary to be prescribed neither to undergo any other treatment.

Appropriate use of the detergent.

If severe conditions of the skin like the eczema already exist (infection in the skin) and allergies, it is needed to be careful. The suavizantes and detergents can irritate the sensitive skin, due to their chemical properties. Therefore, what should make is to try to prove an or two pieces of clothes with the detergent and to see if any allergic reaction is presented.

## IT LEAVES PRACTICE

### CHAPTER VII

#### 7 PROCESSES OF APPLICATION.

For the development of this chapter you proceeds to have the cloth that will use that it is 100% cotton and the size of the piece in that you/they will be carried out the samples.

We will name the laboratory instruments that he/she got ready to begin with the tests to be carried out:

##### Laboratory instruments

- \* Lighter
- \* Precipitation glass
- \* Scale
- \* Bar of agitation
- \* Thermometer
- \* Test tube

##### Application materials

- \* Cloth (100% cotton)
- \* It dilutes
- \* Crémor tartar (mordant)
- \* Lived cabbage (the supreme one)

#### 7.1 Design of the samples.

The design of the samples is small pieces of cloth of 100% cotton with measures proposals some of 20cm \* 20cm and handbags of 37\*37 for the realization of some tests that you/they were made in each process with the purpose of having an appropriate visibility.

#### 7.2 Tests of application of the crémor tartar.

The tests and application processes were carried out appropriately and logically so that the mordant one can be impregnated better and to be able to obtain better results.

##### 7.2.1 Variables to Consider.

The variables to be considered in the application of the crémor tartar are depending to the weight of the sample of the material it was used the bathroom relationship as well as him% of the crémor tartar.

##### 7.2.2 Temperature.

The temperature is a magnitude referred to the notions common of hot, lukewarm, I fry that can be measured, specifically, with a thermometer.

##### 7.2.3 Relationship of Bathroom.

The bathroom relationship is that term that is used to know the quantity of water that it will use in the finish.

For the impregnation of the crémor tartar that is the step that was carried out in the samples before to place the supreme of the lived cabbage a bathroom relationship was used according to the weight.

#### 7.3 Tests of application of the supreme one of the lived cabbage.

Already carried out the step of the impregnation of the crémor tartar was carried out the process of impregnation of the supreme one of the lived cabbage taking into account the previous process that was given to the sample.

##### 7.3.1 Concentration.

In the concentration step it is where it was used the different materials that were applied since it is another extremely important parameter to be able to give an effective finish to the sample.

### 7.3.2 Temperature.

The temperature is a magnitude.

### 7.3.3 Time.

The time corresponds to the minutes that you/they take into account when being carried out each step of the process.

### 7.4 Tests of application of the different detergents.

After the realization of the dye process with the supreme of the lived cabbage is processed to the previous step where the process of laundry of boy's clothes will be analyzed with the sample to know the ph that has in the whole process of the laundry until the final term.

N°7 proves

#### Informative data

- \* N°7 proves: I process



impregnation of the crémor tartar and the supreme of the lived cabbage.

- \* **Material:** Cloth 100% cotton (CO)

- \* **I weigh Material:** 5.14 gr
- \* **Team:** Open

R/B: 1/30 = 165 ml

- \* **Temperature:** 90°C
- \* **Process of impregnation of the crémor tartaro:**80%
- \* **Process of impregnation of the supreme one of the lived cabbage:** 80%
- \* **Date of Realización:**13-11-2012

#### Procedure:

- \* To weigh the sample of fabric plane.
- \* According to the bathroom relationship he/she was carried out the necessary calculations to know the quantities in grams from each one of the products to use in the treatment of the cloth like:
  - ✓ Crémor tartar.
  - ✓ Supreme of the lived cabbage.
- \* To place the water in the lighter, and you continued to elevate the temperature from the bathroom to 90 °C where the product was added TO, then it was removed using the bar of agitation until achieving the breakup of this product in the bathroom.

#### Observations:

- \* In the addition of the products TO it was observed that the time

that was given was enough so that it is diluted the crémor tartar completely.

- ✱ In the addition of the product B gave good been since it is needed of a bigger concentration so that the cloth obtains an appropriate color.

### Results:

Once concluded the experimental process of the treatment using the suitable concentrations, it was analyzed the following results:

- ✱ The mordant one you impregnates in the cloth in their entirety.
- ✱ The supreme of the lived cabbage finished impregnating in the cloth.
- ✱ The color obtained its intensity.

### Recommendations

- ✱ It recommends to control each one of the suitable parameters to obtain a satisfactory result.
- ✱ It is recommended to maintain in constant movement during the exhaustion.
- ✱ The constant movement of the cloth is recommended using the bar of agitation so that in this the products penetrate in the spaces of the fibers.

Impregnation of the crémor tartar:



It figures 1



It figures 2

Impregnation of the supreme one of the lived cabbage:



It figures 3

## CHAPTER VIII

### 8 TESTS OF SOLIDITY AND NEUTRALIZATION

#### 8.1 Solidity to the laundry and mensuration of the ph.

##### 8.1.1 Solidity applied to the beginning with detergent marks he/she leaves.

The objective of this test is to evaluate the solidity to the laundry of the sample that you/they undergo a laundry in the machine.

LAUNDRY: It is the process that is made to try to remove previous chemical substances to the laundry, through the soapy solution, their mouthwashes, and their respective drying.

It is the resistance from a material to the change in some of their color characteristics.

#### NEUTRALIZATION:

A neutralization reaction is carried out when combining an acid with an it bases on general they produce a hydroxide forming water and salt.

#### TESTS OF LAUNDRY



##### 8.1.1.1 applied to the beginning of the laundry process

#### It shows #1



col lombarda	rojo intenso	rojo violeta	violeta violeta	azul violeta	azul 7.5	azul 9	verde azulado	verde 12	verde amarillo
color	<2	4	6	7	7.5	9	10	12	>13
pH	<2	4	6	7	7.5	9	10	12	>13

#### Procedure to the obtaining of the sample to the laundry:

- The sample was obtained with the wanted color of the supreme one of the lived cabbage.
- He/she got ready the machine for the laundry.
- He/she got ready the% of the detergent of 50gr to insert in the laundry machine.
- The clothes was added in the laundry machine.
- The sample was added at the beginning of the laundry process.
- The time of the laundry was of 57 min.
- After this process it was the term of the laundry.

#### Results:

- The result was that a pH was obtained 10 basic in which was compared with the chart of ph of the lived cabbage.

#### APPLIED 8.1.2 SOLIDITY TO THE BEGINNING WITH DETERGENT OMO MARKS MATIC



### 8.1.2.1 Applied to the beginning of the laundry process

#### Tests with Omo

It shows #1



col lombarda									
color	rojo intenso	rojo violeta	violeta	azul violeta	azul	azul verde	verde azulado	verde	verde amarillo
pH	<2	4	6	7	7.5	9	10	12	>13



#### Procedure to the obtaining of the sample to the laundry:

- The sample was obtained with the wanted color of the supreme one of the lived cabbage.
- He/she got ready the machine for the laundry.
- He/she got ready the% of the detergent of 50gr to insert in the laundry machine.
- The clothes was added in the laundry machine.
- The sample was added at the beginning of the laundry process.
- The time of the laundry was of 57 min.

- After this process it was the term of the laundry.

#### Results:

- The result was that a pH was obtained 9 basic in which was compared with the chart of ph of the lived cabbage.

### 8.1.3 solidity applied to the beginning with detergent marks fab



#### Tests with Fab

### 8.1.3.1 Applied to the beginning of the laundry process

It shows #1



col lombarda									
color	rojo intenso	rojo violeta	violeta	azul violeta	azul	azul verde	verde azulado	verde	verde amarillo
pH	<2	4	6	7	7.5	9	10	12	>13



**PH: 10**

#### Procedure to the obtaining of the sample to the laundry:

- ✿ The sample was obtained with the wanted color of the supreme one of the lived cabbage.
- ✿ He/she got ready the machine for the laundry.
- ✿ He/she got ready the% of the detergent of 50gr to insert in the laundry machine.
- ✿ The clothes was added in the laundry machine.
- ✿ The sample was added at the beginning of the laundry process.
- ✿ The time of the laundry was of 57 min.
- ✿ After this process it was the term of the laundry.

### Results:

The result was that a pH was obtained 10 basic in which was compared with the chart of ph of the lived cabbage.

### 8.1.4.1 PREUBAS OF NEUTRALIZATION

#### THIRD TEST

Applied at the end of the laundry process



col lombarda	rojo intenso	rojo violeta	violeta	azul violeta	azul	azul verde	verde azulado	verde	verde amarillo
pH	<2	4	6	7	7.5	9	10	12	>13



### PH: 7.5

For the obtaining of the result of the sample you proceeded to the laundry with citric acid to be able to lower the ph at the end of the laundry process.

### Procedure for the neutralization.

- ✿ Preparation of the machine for the laundry.
  - % of the detergent of 28gr to insert in the laundry machine.
- ✿ To add the clothes in the laundry machine.
- ✿ To add the sample to the intermission of the laundry of the laundry process.
- ✿ The time of the laundry was of 22 min where it is placed 4g of citric acid.
- ✿ After this process it was the term of the laundry.

### Results:

- ✿ The result was that a pH was obtained 7.5 basic in which was compared with the chart of ph of the lived cabbage and with 8 gram of citric acid you arrived to the appropriate ph.

### 8.1.4.2 TESTS OF NEUTRALIZATION WITH VINEGAR.

#### SECOND TEST

Applied to the intermission of the laundry process



col lombarda	rojo intenso	rojo	violeta	violeta	azul	azul	azul	verde	verde	verde	amarillo
color	rojo intenso	rojo	violeta	violeta	azul	azul	azul	verde	verde	verde	amarillo
pH	<2	4	6	7	7.5	9	10	12	>13		



**PH: 7.5**

For the obtaining of the result of the sample you proceeded to the laundry with vinegar to be able to lower the ph at the end of the laundry process.

### Procedure for the neutralization.

- Preparation of the machine for the laundry.
- % of the detergent of 28gr to insert in the laundry machine.
- To add the clothes in the laundry machine.
- To add the sample to the intermission of the laundry of the laundry process.

- The time of the laundry was of 22 min where it is placed 11g of vinegar.
- After this process it was the term of the laundry.

### Results:

- The result was that a pH was obtained 7.5 basic in which was compared with the chart of ph of the lived cabbage and con 11 gram of vinegar you arrived to the appropriate ph.

### 8.2 solidity to The solar rays.

The evaluation of the solidity to the solar light is carried out by the light of the natural sun of the day to be able to observe the changes that you/they can or not to suffer the carried out samples.

### 8.3.1 Secado to the solar light

He/she has been carried out drying tests to light of the sun.

Where it was observed that the color obtained in the sample acquired other results.



Before drying off in the sun after the drying

It was left that is to say to exhibition of the sun during one hour 60 minutes.

Then I retire it and we see the obtained results.

### **Results to the solar light.**

- ✿ To the solar light the sample suffers some changes the color it is not obtained that is expected.

### **8.3.2 Drying to the shade.**

He/she has been carried out drying tests to the shade to be able to compare the results that they are obtained with this second drying method.



Before the drying to the shade after the drying to the shade

He/she allowed to dry off that is to say in the shade during one hour 60 minutes.

Then I retire it and we see the obtained results.

### **Results of the drying to the shade.**

- ✿ The sample didn't suffer any variation in the drying to the shade.

## CHAPTER IX

### 9 ANALYSIS OF RESULTS AND COSTS. \

#### Analysis of results.

#### Result.

Once concluded the experimental process of the treatment using the suitable concentrations, it was analyzed the following results:

- The mordant one you impregnates in the cloth in their entirety.
- The supreme of the lived cabbage finished impregnating in the cloth.
- The color obtained its intensity with an appropriate color.

#### Result.

Once concluded the experimental process of the treatment using the suitable concentrations, it was analyzed the following results:

- The mordant one you impregnates in the cloth in their entirety.
- The supreme of the lived cabbage finished impregnating in the cloth.
- The color obtained its intensity.

#### 9.2. Analysis of costs.

##### 9.2.1 Costs first sample

- Matter prevails direct.

For the realization of this project it was used as matter the cloth 100% cotton it prevails. (Cloth indu)

For the sixth sample it was used pieces of cloth of 20x20.

Wide: 1.40

Long: 100cm

Area is of  $140 \times 100 = 14000(\text{cm}^2)$

$20 \times 20 = 400(\text{cm}^2)$

14000( $\text{cm}^2$ )          6,50usd

400 ( $\text{cm}^2$ )           $x = \frac{400 \times 6.50}{14000} =$

o. 18ctvs

<b>Material</b>	Cloth indu
<b>USD/mts</b>	6.50
<b>Quantity in kg of crémor tartar</b>	400 ( $\text{cm}^2$ )
<b>Total cost</b>	\$ 0.18 ctvs.

#### ☒ As mordant (crémor tartar)

The cost of the kilogram of the crémor tartar is 10 usd

That which was used according to the weight of the material for the sixth sample.

I weigh of the material: 5.14g

I am carried out it to a percentage of the one: 70%

100%          5.14g

70%           $x = \frac{70\% \times 5.14g}{100\%} =$

3,598gctvs

To take out the cost in kilograms:

1kg          1000 g



Total cost	\$ 0,010 ctvs.
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- **Direct manpower**

To determine the cost of each process he/she took like base the basic salary.

I weld basic = 318 USD

USD/day= 10, 6 / 8= 1.32

USD/hour = 1, 32 / 60 = 0.02ctvs.

USD/ minute = 0.02ctvs.

⊗ **Layout and Cut**

For the line and court of the sixth sample

I am carried out it in 8min

Then:

1min                    0.02 ctvs.

5 min                     $x = \frac{5 \text{ min} \times 0.02 \text{ctvs}}{1 \text{min}} =$

0.10ctvs

⊗ **Making**

In the making what one carries out is the one bordered of the sample.

1min                    0.02 ctvs

<b>Process</b>	union of pieces
<b>USD/min</b>	0.02
<b>Time</b>	3min
<b>Total cost</b>	0.06ctvs

3min                     $x = \frac{3 \text{ min} \times 0.02 \text{ctvs}}{1 \text{min}} =$   
0.06ctvs

**Total of manpower**

Detail	Subtotal
Layout and cut	0.10 ctvs.
Making	0.06 ctvs.
<b>TOTAL COST</b>	<b>0.16 ctvs.</b>

- **Indirect costs of production.**

In the carried out tests the indirect costs of production will be seen that it was observed that wasted away of electric light in the whole process of the licuadora.

Electric power = 0,082usd/Kwh

**For the electric power it will be seen that it was used the licuadora and the washing machine.**

⊗ **Licuadora**

In the appliance of the licuadora according to the monthly consumption the energy cost was determined that was used.

FOR THE CONSUMPTION ELECTRCIO OF THE LICUADORA

600 w consumes the licuadora

1000wh or 1kwh voucher 0,082 dollars  
in equator

30 min =0.5 h q is the time used in the  
tests

600 w x 0,5h = 300wh consume the  
licuadora in 30 min

1kwh      0.082

$$300wh \quad x \quad x = \frac{300wh \times 0.082}{1000wh} =$$

0.024ctvs

- **Cost of light in machinery**

**It schemes overlock**

**1kwh    0.082 ctvs.**

1000 w= 1kw

1000w      1kw

186,5w      x      x =

$$\frac{186.5w \times 1kw}{1000w} = 0.19kw$$

This multiplies for the hour's q one has  
in kWh

0, 19 kW x 0,5h = 0.1 kWh

Now if it charges the kWh to 0.082 cents  
the electric company we transform again

1 kWh    0.11

0,1kwh    x      x =

$$\frac{0.1kwh \times 0.11ctvs}{1kw} = 0.01ctvs$$

- Machinery depreciation
- Machine overlock

Overlock =

Depreciation = machinery value

= annual depreciation

Useful life

$$\text{Depreciation} = \frac{1200}{10} = 120$$

Depreciation = annual depreciation =  
monthly depreciation

12

$$\text{Depreciation} = \frac{120}{12} = 10$$

Depreciation = monthly depreciation =  
daily depreciation

30

$$\text{Depreciation} = \frac{10}{30} = 0.30$$

Depreciation = daily depreciation =  
depreciation per hour

8

$$\text{Depreciation} = \frac{30}{8} = 0.037ctvs$$

Then the cost for machinery is the  
following one

It schemes overlock

1min    0.037 ctvs.

$$4\text{min} \quad x = \frac{4 \text{ min} \times 0.037 \text{ctvs}}{1\text{min}} =$$

0.14ctvs

- Water

In the carried out tests the indirect costs of production will be seen that it was observed that wasted away of drinkable water in the whole process

30 - 40 m<sup>3</sup> of water is worth 0,39 dollars

1 m<sup>3</sup> de agua = 1000lt

30 m<sup>3</sup> = 30000lt

30000lt                      0,39ctvs.

$$1\text{lt} \quad x = \frac{1\text{lt} \times 0.39\text{ctvs}}{30000} =$$

0.000013ctvs

#### **Total of indirect Costs of production.**

<b>Detail</b>	<b>Subtotal</b>
Licuada	0.024 ctvs.
Cost of light of the maqui.Overlock	0.01 ctvs.
Depreciation Machinery overlock	0.14 ctvs.
Wáter	0,000013 ctvs.
<b>Total costos</b>	<b>0.174013</b> ctvs.

#### Total of costs

<b>Detail</b>	<b>Subtotal</b>
Matter prevails	0.545 ctvs.
Matter prevails insinuation	0,010 ctvs.
Manpower	0.16 ctvs.
Indirect costs of production	0.174 ctvs.
<b>TOTAL COST</b>	<b>0.889</b> ctvs.

## **10.CONCLUSIONS AND RECOMMENDATIONS**

### **10.1 Conclusions.**

In the time of development of this project you reached the following conclusions.

- The designs of the samples are carried out to already measure the ph of the garments finished of washing.
- The mordant one to be used was the crémor tartar, it is important so that he/she notices the coloring to be applied, it was according to the weight of the cloth, where in the range of the 20% hasta 60% was not obtained good been the coloring since he/she didn't notice a lot to the cloth, while in the level of 70% to 100% the sample obtained the result that it was expected.
- You concludes that the supreme of the lived cabbage is the purest thing, extracted with the licuadora and been slippery with the cernidor to
- obtains alone the supreme one with out sludges if you the

mixture with a lot of water spreads to change its color tone while if he/she is carried out it with its natural color the sample he/she obtains that waited.

### **10.2 Recommendations.**

- To use the cloth since in fabric plane 100% cotton is much more economic that the cloth of having knitted point, it is important to lower the costs of each sample.
- To liquefy during 30 minutes the leaves of the cabbage lived for the obtaining of the supreme one in which separates the residuals and alone the liquid will be used.
- To elaborate in a clean place using the appropriate materials for further accuracy at the end of the whole process.

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