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A STUDY OF WOMEN'S SCARF MADE UP OF MIK CASEIN FABRIC

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ABSTRACT

The objective of this case study is to understand that milk fabric is used to make the scarf using Tie and dye method . In this case, 'Tie & Dye' method has been used to give color to the fabric with the help of acid dyeing.

Milk fabric is manufactured by knitting. It is a delicate fabric, hence it is preferably used for giving a beautifying and decorative look to the wearer. In this case study, scarves are made from milk fabric. Different cut shapes of scarves including square & rectangle have been introduced to the market.

In order to enhance the overall look of the scarf, embellishment is done on the scarf with lace. Keeping the summer collection in mind, Tie & Die method has been used to bring out the bright & colorful features in the scarf.

The major significance of this collection lies in satisfying customers, no collection is complete without feedback from customers as every collection should be directed towards market segmentation. A detailed market survey has been conducted through a set of questionnaire which covers all the aspects and parameters that decide the potentiality of this collection.

INTRODUCTION

.Different sorts of natural fibers were used by people of all nations around the world for ages and various fabric forming techniques allowed them to have different sorts of textile for making clothes. Later, with the development of chemical technologies the number of available materials has ballooned. There are two basic types of synthetic material. The first one contains cellulose (regenerated fibres) while the other one does not contain any cellulose and is made entirely of chemical substances.

Milk fiber is made from milk protein base. A new generation of innovation fiber, this is made by using a new bioengineering technology-by preparing protein spinning fluid suitable for wet – spinning process. Milk protein fiber is a kind of fresh fiber that has very healthy functions. It combines the advantages of both, natural, as well as synthetic fibers. It is a fresh product as superior green, healthy and comfortable fiber. The fabrics made of these fibers nourish and take care of skin in a very efficient manner by keeping away allergies and even wrinkles.

SCOPE OF WORK.

Milk protein fiber is one kind of new milk regenerated fiber, which bears both advantages of natural fiber and synthetic fiber, i.e., soft and smooth hand, good moisture absorption behavior, good permeability, excellent dyeing properties, special natural micro–organism resistance and helpful for health care.The fabric knitted by this kind of fiber possesses the characteristics of soft lustre,smooth hand, thin thickness, good crispness, good air permeability, good moisture retain-ability and good drapability,suitable for developing knitted underwear fabrics and top grade spring and summer apparel fabrics**.** Milk fibers are more expensive compared to other natural fibers.

Milk fabrics have excellent dye-ability, hence an effort is taken to dye the knitted milk fabrics using the Acid dyes through the techniques of Tie and Dye.

At the same time through this valiant effort the appeal and value of the finished fabrics made out of these yarns is expected to be quite at higher end with increased comfort in milk casein material and the reach of milk would become possible to everyone.

OBJECTIVES

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- To dye the knitted fabric using Acid dyes using the technique of Tie and Dye
- To evaluate colour fastness of the dyed knitted fabric
- Development of knitted scarf

REVIEW

LITERATURE

DETAILS ABOUT MILK CASEIN FIBER

The expanding apparel and clothing industry poses new challenges before the textile manufactures and producers. Today textile industry is not only full filing the basic needs of clothing but also to satisfy our aesthetic senses. As the natural materials were not enough, it has developed techniques for creating synthetic fibers even from chemicals. With the invention of new textile fibers, there is one such unique innovative protein fiber known as "MILK PROTEIN FIBER". It is chemically known as CASEIN FIBER.(13)

Fig .2. 1. Staple form of Milk fibers

Fig. 2.2. Filament form of Milk fibers

Milk protein fiber is a kind of fresh fiber that has very healthy functions. It combines the advantages of both, natural, as well as synthetic fibers. It is a fresh product as superior green, healthy and comfortable fiber. The fabrics made of these fibers nourish and take care of skin in a very efficient manner by keeping away allergies and even wrinkles.

The emergence of milk protein fiber updates the traditional definition of animal protein fiber. Being the optimal combination of nature and hi- tech, it is more accommodated to the needs of the people's modern lifestyle.

The skin friendly Milk Yarn goes to make glossy and luxurious fabrics similar to Silk fabrics that have antibacterial and antifungal properties too. Their hydroscopic character makes them one of the finest moisture management fabrics. They can be blended with a number of fibers to get many characteristics. Blend them with bamboo and get cool fiber and with wool fiber to have a thermal protective fiber.

The most important material of Milk fiber is milk protein, which contains 17 kinds of amino acids, and with natural and permanent bacteriostatic function, the bacteriostatic rate to those bacteria such as staphylococcus aureus, Candida albicans, fungal and disease mildew is up to 80%. The plentiful natural protein humectants factor is contained in the milk fiber, which makes skin more delicate and smooth , so it is suitable for household textiles. The Milk casein proteins , which can nourish and lubricate the skin. The Milk protein contains natural humectant factor, which can capture the moisture and maintain skin moisture to make the skin tender and smooth to reduce wrinkles.

Milk protein fiber has also passed Oeko – Tex Standard 100 green certification for the international ecological textiles. No special treatment is necessary for garments made from Milk protein, provided that the specified washing method is fallowed, its handle,colour and surface will maintain at its best. The Milk fibers as of with its freshness and superior qualities will become popular goods in the market as new favourite of the textile trade.(16)

MILK FIBER

Milk protein fiber is one kind of new milk regenerated fiber,which bears both advantages of natural fiber and synthetic fiber, i.e.,soft and smooth hand, good moisture absorption behavior, good permeability, excellent dyeing properties, special natural micro – organism resistance and helpful for health care.The fabric knitted by this kind of fiber possesses the characteristics of soft lustre,smooth hand,thin thickness,good crispness, good air permeability,good moisture retain-ability and good drapability,suitable for developing knitted underwear fabrics and top grade spring and summer apparel fabrics.

PROTEINIC FIBERS

These fibers are built up of from proteins, which are high molecular substances composed of many amino acids. These are the basic units and they combine to form polypeptide chains. An amino acid contains a carboxyl group (which is characteristic for organic acids) and a amine.

Kinds and content of amino acid in Milk protein fiber

Table 2.1 kinds of amino acid in milk protein fiber

Kinds of amino acid	Actual data
Aspartic acid	2.039
Threonine	0.9918
Serine	1.429
Glutamic acid	5.549
Pro	2.529
Methionine	0.7587
Isoleucine	1.101
Leucine	2.493
Tyrosine	1.572

Phe	1.331
Glycocoll	0.5259
Alanine	0.9037
Crystine	0.0815
Val	1.71
Lysine	2.289
Histidine	0.8602
Arginine	0.9246
Tryptophan	0.1831

These are the 18diffent types of amino acids.

HISTORIC BACKGROUND

Casein dates back many centuries when it was used as a binder for paints. Many 14th and 15th century churches that were painted with casein paints still appear bright and unfaded even to this day. Milk fiber was invented in 1930's in Italy and America to compete with wool. The fiber is environmentally friendly, demonstrates superior strength and has many of the same properties of wool .It truly redefines the traditional definition of an animal protein fiber.Among the modern fabrics is the one that is produced from milk protein. The first fiber of this type was developed in Italy by the chemist Ferretti in 1935.Casein fibers are variously named according to the countryof manufacture: Lanital (Italy), Tiolan (Germany0, Plan (Poland), Lactofil(Holland) and Courtauld's casein fiber(England). Casein is precipitated from milk treated with dilute sulphuric acid . The precipitate is dissolved in a coagulating bath of sulphuric acid and hardened. The filaments are cut into short lengths like wool and spun into threads.Casein fiber is soft and feels somewhat like wool. Under the microscope, however, it presents a smooth surface like rayons unlike the scaly surface of wool.The fiber is used as a substitute for wool, as it has similar handle and heat insulating properties .Its great advantage over wool is that it has no felting properties. It readily absorbs alkali from warm soap solutions and becomes plastic. It takes dyes more rapidly and at a lower temperature than wool but fades easily. It is non – shrinkable and is not attacked by insects. However,casein fiber is not as elastic or strong as wool, and stretches much less, especially when wet .It is used primarily as a bending fiber to capitalize on its soft texture.(8)

When cut to staple – length fiber casein has many properties of wool. Fibers are white, fluffy, springy, and have a pleasant odour. When blended with other fibers casein added a soft draping quality and resiliency to fabrics. Fibers was blended with wool for creating felt and with spun rayon, wool, mohair and cotton for attractive woven and knitted fabrics in a variety of weaves, textures and prints.

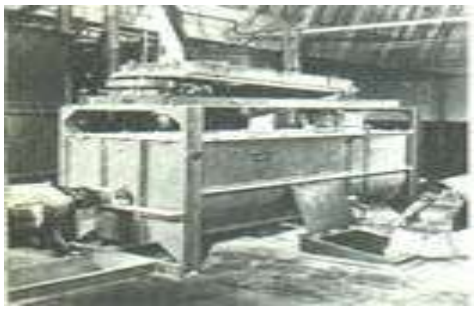


Fig. 2.3. Ground casein is poured into this 'Trap door'

Ground casein is treated with chemicals and heated in huge vats to form a solution,which is forced into spinnerets; washed, dried, cut into staples and baled to yarn-making plants for spinning and blending.

Fig 2.4. Textile drapery

Textured drapery made from soft casein yarns combined with other fibers. Though caseins can be laundered with care the same as wool, they loose strength when wet and must be handled gently. They cannot be kept damp for any length of time due to quick mildewing. Three successful brand names were Aralac in America and Lanital and Mernova in Italy.(14)

MANUFACTURING PROCESS OF MILK FIBERS

Milk protein fiber is dewatered and skimmed milk which is manufactured into the protein spinning fluid suitable for wet spinning process by means of new bioengineering technique, chemically they are known as casein fibers.

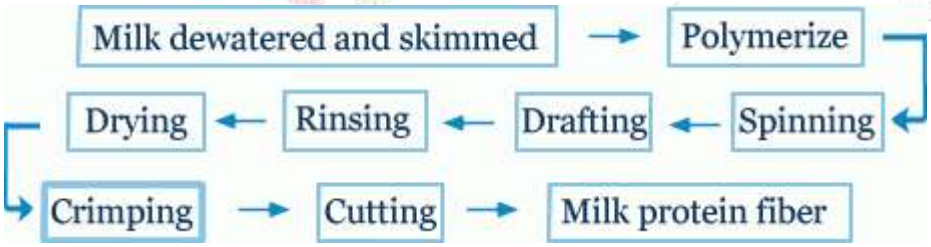


Fig. 2.5 Flowchart of Milk fiber production.

REFERENCE FOR SOME OF THE PROCESSES

PRE – TREATMENT

The mass specific resistance of milk protein fiber is larger ,so the pre – treatment before scotching is more important . After opening bales, the milk protein fibers needs some water and antistatic agent. Pre treatment and the process condition of milk protein blended fabric and elastic fabric were introduced. Owing to strong yellowing of milk protein fiber , its bleaching process was adopted reductant bleaching or hydro peroxide + reductant bleaching according to the shade, for light shade brigthning process was used.

PROCESS OF OPENING AND PICKING

With good uniformity and less impurity, the protein fiber is bulky and it is easy to open , and the friction co – efficient between fibers is low , and the cohesive force is relatively weaker.

DRAWING:

Since the milk protein fiber is bulky and with weaker cohesion force, the extended parallelization of fibers in card sliver is worse, and much hooked fiber exists, the extended parallelization of fiber should be improved as much as impossible during to reduce the weight uniformity.

ROVING

With long fiber length, the mass of specific resistance of milk protein fiber is large and the friction co – efficient is small so, the twisting co –efficient of roving should be bigger unless hard head appears in spun yarn. And the elongation rate should be controlled to reduce accidental elongation, which is favorable to improve standards.

SPINNING

Since the fiber is soft,smooth and with weaker cohesion force, the amount of hairiness and thick and thin yarn always appear during spinning. Therefore, the technological principal of bigger twisting, smaller drafting ratio in the rear zone, larger roller guage in the rear zone and small “rip guage” shold be adopted.To discuss the spinning processing of milk protein fiber, the main influence factors on spinning milk protein fiber yarn were analysed according to the performance speciality and spinning practice of milk protein fiber. Reasonable processing parameters were confirmed, increasing the guage of cylinder flat and wire working angle was proposed. Processing principle of heavier pressure and bigger guage were adopted in drawing process, Bigger twist factor was adopted in roving process, non- treatment top roller was adopted in spinning process to enhance yarn quality.

WINDING:

In winding ,the electronic clearer is used and the air splice is adopted to piece the speed of drum is 1800/min, the resultant yarn quality reaches the design requirements.

CASEIN ISOLATION AND FIBER–MAKING

Casein is obtained by the acid treatment of skimmed milk. The curdy precipitate is washed free of acid, dried and then ground to a fine powder.1kg casein is produced from about 35 – 37 litres of skimmed milk. A blend of casein from different batches is then dissolved in NaOH solution and the solution is allowed to ripen till it reaches a viscosity level suitable for spinning .It is then filtered, deareated and extruded through spinnerets into a coagulation/regeneration bath containing sulfuric acid(2.0 – 2.5 parts),formaldehyde(4 – 5 parts), glucose (18 – 20 parts) and water (100 parts).The extruded casein solution coagulates into protein filaments much like

coagulation of viscose solution into viscose filaments. The coagulated filaments remain swollen in water and are very weak. To be treated in a manner that would enable the long chain molecules of protein to hold together in the aqueous medium while developing adequate strength and dimensional stability.

Establishment of frequent intermolecular hydrogen bonds and widely spaced cross- links at this stage prevent the chain molecules from being pushed apart by water molecules.The process of transformation of the swollen ,soft filaments to collapsed, hard and stretchable filaments is known as hardening. The key to the hardening process is cross- linking by reactions involving formaldehyde and the oriented protein chain molecules and the tow may be further steeped in dilute formaldehyde solution and further stretched at this stage. The tow is then washed,dried, mechanically crimped and cut into staple lengths. Appropriately blended with wool,the blend may then be carded and combed and turned into slivers and rovings for spinning into yarns by flyer spinning or ring spinning techniques. Blends with cotton ,rayon and flax are also useful.Weaving of the blends does not pose much problem.

PROPERTIES

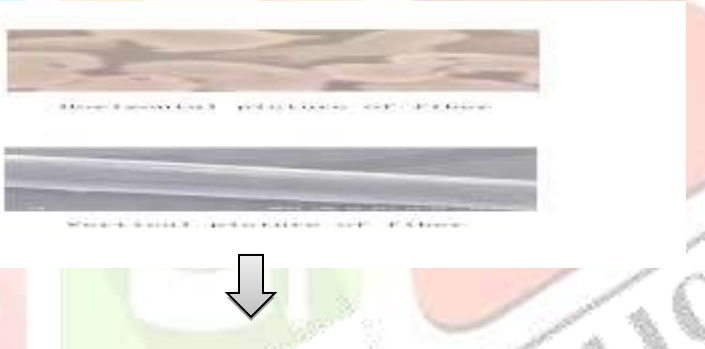


Fig 2.5 (Milk fibers, Top: horizontal view/ Bottom: vertical view)

ESSENTIAL PROPERTIES OF MILK YARNS

Good moisture – absorption and conduction

The fiber base body does not have regular channels, which makes the fiber have as fine moisture absorption as natural fiber and better moisture conduction than synthetic fibers – milk fiber is both comfortable and permeable.

Excellent dyability

The fibers can be dyed in bright colours using reactive, acid or cationic dye technology.

Antimicrobial properties

A unique spinning solvent utilization zinc ions is used in the spinning solvent when the fibers are produced. After drying and treatment this solvent produces zinc oxide , giving the fibers an inherent bacteriostatic property.

- They are comfortable white, fluffy and springy.
- PH of 6.8 (same as the human skin)
- Can be blended with most any fiber.

Thermal and tensile properties of Casein protein fiber

The tested and analysed thermal properties of casein protein fiber with DIG and DSC. The results showed the low hygroscopicity of this fiber , and the thermal cracking began at 262.7℃ and reached its peak at 317.6℃. The tensile experiment showed that the wet tensile strength and breaking elongation of this fiber is weaker than they are in dry state.

Fabrics Blended with Milk Protein fiber:

The milk protein fiber is studied to analyse and compare the properties of breaking strength, bursting strength, Wear resistant fastness, Wrinkle flexibility, Drape, pilling, property,permeability and heat retention. The result shows that milk protein fiber is suitable to be blended with natural or synthetic fiber, among them the fabric blended with cotton is soft, has good permeability and heat retention, is suitable for underwear, socks and other wearing fabrics.(5)

KNITTING MACHINE PARAMETERS

The Single machine is used to knit the fabric, the machine settings was constant and all the parameters was same throughout the fabric knitting process.

Table.3.1. Knitting machine parameter	
Fabric type	Single jersey
Machine make	Smart – Taiwan
Feeders	54
Guage	20
Diameter	18 Inches
Total needles on machine	1134
No. of needles/inch	63
Knitted speed	20 rpm
Loop length set	35 CM/100 Needles

ACID DYES

An **acid dye** is a dye which is a salt of a sulfuric, carboxylic or phenolicorganic acid. The salts are often sodium or ammonium salts. Acid dyes are typically soluble in water and possesses affinity for amphoteric fibers while lacking direct dyes' affinity for cellulose fibers. When dyeing, ionic bonding with fiber cationic sites accounts for

fixation of colored anions in the dyed material. Acids are added to dyeing baths to increase the number of protonated amino-groups in fibers.

FIBERS DYED USING ACID DYES

In textiles, acid dyes are effective on protein fibers, i.e. animal hair fibers like wool, alpaca and mohair. They are also effective on silk. They are effective in dyeing the synthetic fibernylon, but of minimal interest in dyeing any other synthetic fibers.

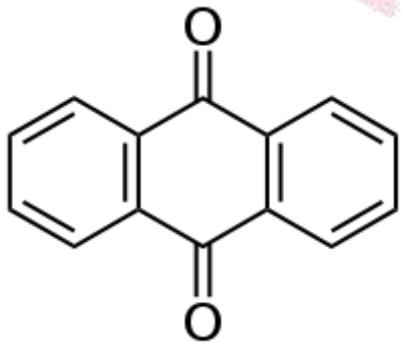
Description

Acid dyes are generally divided into three classes which depend on fastness requirements, level dyeing properties and economy. The classes overlap and generally depend on type of fiber to be colored as well as the process used.

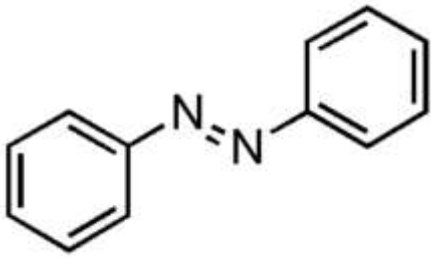
Acid dyes affix to fibers by hydrogen bonding, Vander Waals forces and ionic bonding. They are normally sold as the Sodium salt, therefore they are in solution anionic. Animal proteinfibers and syntheticnylon fibers contain many cationic sites. Therefore, there is an attraction of anionic dye molecule to a cationic site on the fiber. The strength (fastness) of this bond is related to the tendency of the dye to remain dissolved in water over fixation to the fiber.

History of acid dye

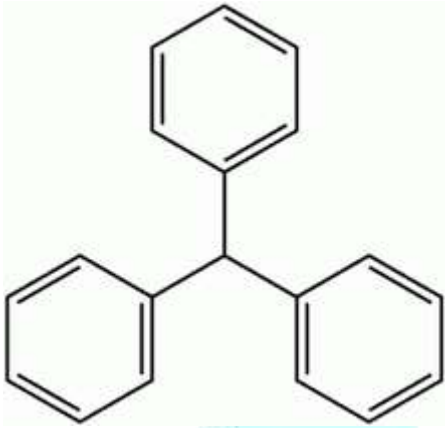
Structures



Anthraquinone derivatives generally form blue dyes



Azobenzene derivatives generally form red dyes



Triphenylmethane derivatives generally form yellow or green dyes

The chemistry of acid dyes is quite complex. Dyes are normally very large aromatic molecules consisting of many linked rings. Acid dyes usually have a **sulfo** or **carboxy** group on the molecule making them soluble in water. Water is the medium in which dyeing takes place. Most acid dyes are related in basic structure to the following:

Anthraquinone type: Many acid dyes are synthesized from chemical intermediates which form anthraquinone-like structures as their final state. Many blue dyes have this structure as their basic shape. The structure predominates in the leveling class of acid dye.

Azo dyes: The structure of azo dyes is based on azobenzene, Ph-N=N−Ph (see image on right showing cis/trans isomers) Although azo dyes are a separate class of dyestuff mainly used In the dyeing of cotton (cellulose) fibers, many acid dyes have a similar structure, and most are red in color.

Triphenylmethane related: Acid dyes having structures related to triphenylmethane predominate in the milling class of dye. There are many yellow and green dyes commercially applied to fibers that are related to triphenylmethane.

Classes of acid dyes

Equalizing/leveling acid dyes: Highest level dyeing properties. Quite combinable in trichromatic shades. Relatively small molecule therefore high migration before fixation. Low wet fastness therefore normally not suited for apparel fabric.

Milling acid dyes: Medium to high wet fastness. Some milling dyes have poor light fastness in pale shades. Generally not combinable.Used as self shades only.

Metal complex acid dyes: More recent chemistry combined transition metals with dye precursors to produce metal complex acid dyes with the highest light fastness and wet fastness. These dyes are also very economical. They produce, however, duller shades.

Tie-dye

Tie-dye is a modern term coined in the mid-1960s in the United States for a set of ancient resist-dyeing techniques, and for the products of these processes. The process of tie-dye typically consists of folding, twisting, pleating, or crumpling fabric or a garment and binding with string or rubber bands, followed by application of dye(s). The manipulations of the fabric prior to application of dye are called resists, as they partially or completely prevent the applied dye from coloring the fabric. More sophisticated tie-dyes involve additional steps, including an initial application of dye prior to the resist, multiple sequential dye and resist steps, and the use of other types of resists (stitching, stencils) and discharge.

Unlike traditional resist-dyeing techniques, tie-dye is characterized by the use of bright, saturated primary colors and bold patterns. These patterns, including the spiral, mandala, and peace sign, and the use of multiple bold colors, have become cliched since the peak popularity of tie-dye in the 1960s and 1970s. The vast majority of currently produced tie-dyes use these designs, and many are mass-produced for wholesale distribution. However, a new interest in more 'sophisticated' tie-dye is emerging in the fashion industry, characterized by simple motifs, monochromatic color schemes, and a focus on fashionable garments and fabrics other than cotton.A few artists continue to pursue tie-dye as an art form rather than a commodity.

Dyes, fabrics, and discharge agents

A variety of dyes can be used in tie-dyeing, including household, fiber reactive, acid, and vat dyes. Most early (1960s) tie-dyes were made with retail household dyes, particularly those made by Rit. In order to be effective on different fibers, these dyes are composed of several different dyes, and thus are less effective, and more likely to bleed and fade, than pure dyes designed for specific fibers. This is the basis for the famous 'pink socks' phenomenon that occurs when fabrics dyed with mixed dyes are washed with other garments. Most tie-dyes are

now dyed with Procion MX fiber reactive dyes, a class of dyes effective on cellulose fibers such as cotton, hemp, rayon, and linen. This class of dyes reacts with fibers at basic (high) pH, forming a wash-fast, permanent bond. Soda ash (sodium carbonate) is the most common agent used to raise the pH and initiate the reaction, and is either added directly to the dye, or in a solution of water in which garments are soaked before dyeing. Procion dyes are relatively safe and simple to use, and are the same dyes used commercially to color cellulosic fabrics.

Protein-based fibers such as silk, wool, and feathers, as well as the synthetic polyamide fiber, nylon, can be dyed with acid dyes. As may be expected from the name, acid dyes are effective at acidic (low) pH, where they form ionic bonds with the fiber. Acid dyes are also relatively safe (some are used as food dyes) and simple to use. Vat dyes, including indigo, are a third class of dyes that are effective on cellulosic fibers and silk. Vat dyes are insoluble in water in their unreduced form, and the vat dye must be chemically reduced before they can be used to color fabric. This is accomplished by heating the dye in a strongly basic solution of sodium hydroxide (lye) or sodium carbonate (caustic potash) containing a reducing agent such as sodium hydrosulfite or thiourea dioxide. The fabric is immersed in the dye bath, and after removal the vat dye oxidizes to its insoluble form, binding with high wash-fastness to the fiber. However, vat dyes, and especially indigo, must be treated after dyeing by 'soaping' to prevent the dye from rubbing (crocking) off. Vat dyes can be used to simultaneously dye the fabric and to remove underlying fiber-reactive dye (i.e., can dye a black cotton fabric yellow) because of the bleaching action of the reducing bath (see below). The extra complexity and safety issues (particularly when using strong bases such as lye) restrict use of vat dyes in tie-dye to experts (see this page for an example of tie-dye using discharge agents and vat dyes).

Discharge agents are used to bleach color from previously-dyed fabrics, and can be used in a sort of reverse tie-dye. Household bleach (sodium hypochlorite) can be used to discharge fiber reactive dyes on bleach-resistant fibers such as cotton or hemp (but not on wool or silk), though the results are variable, as some fiber reactive dyes are more resistant to bleach than others. It is important to bleach only as long as required to obtain the desired shade, and to neutralize the bleach with agents such as sodium bisulfite, to prevent damage to the fibers. Thiourea dioxide is another commonly used discharge agent that can be used on cotton, wool, or silk. A thiourea dioxide discharge bath is made with hot water is made mildly basic with sodium carbonate. The results of thiourea dioxide discharge differ significantly from bleach discharge. Discharge techniques, particularly using household bleach, are a readily accessible way to tie-dye without use of often messy and relatively expensive dyes.

Designs and patterns

Tie-dye can be used to create a wide variety of designs on fabric, from standard patterns such as the spiral, peace sign, diamond, (see Tie-Dye Wiki)and the marble effect to beautiful works of art. Using techniques such as stencils (a la screen printing using dyes or discharge pastes), clamped-on shaped blocks, and tritik (stitching and gathering), tie-dye can produce almost any design desired.

History of Tie-dye

America

The earliest surviving examples of pre-Columbian tie-dye in Peru date from 500 to 810 AD. Their designs include small circles and lines, with bright colors including red, yellow, blue, and green.

Example of Mudmee tie-dye, an art form originating in Thailand

Asia

Shibori includes a form of tie-dye that originated in Japan and Indonesia. It has been practiced there since at least the 8th century. Shibori includes a number of labor-intensive resist techniques including stitching elaborate patterns and tightly gathering the stitching before dyeing, forming intricate designs for kimonos. Another shibori method is to wrap the fabric around a core of rope, wood or other material, and bind it tightly with string or thread. The areas of the fabric that are against the core or under the binding would remain undyed.

Plangi and tritik are Indonesian words, derived from Japanese words, for methods related to tie-dye, and 'bandhna' a term from India, giving rise to the Bandhani fabrics of Rajasthan. Ikat is a method of tie-dyeing the warp or weft before the cloth is woven.

Mudmee tie-dye originates in Thailand and neighboring part of Laos. It uses different shapes and colors from other types of tie-dye, and the colors are, in general, more subdued. Another difference is that the base color is black.

Africa

Tie-dye techniques have also been used for centuries[*citation needed*] in the Hausa region of West Africa, with renowned indigo dye pits located in and around Kano, Nigeria. The tie-dyed clothing is then richly embroidered in traditional patterns. It has been suggested that these African techniques were the inspiration for the tie-dyed garments identified with hippie fashion.

Tie-dye in the Western world

Tie-dyeing was known in the US by 1909, when Professor Charles E. Pellow of Columbia University acquired some samples of tie-dyed muslin and subsequently gave a lecture and live demonstration of the technique.

Although shibori and batik techniques were used occasionally in Western fashion before the 1960s, modern psychedelic tie-dying did not become a fad until the late 1960s following the example set by rock stars such as Janis Joplin and John Sebastian (who did his own dyeing). The 2011 film documentary *Magic Trip*, which shows amateur film footage taken during the 1964 cross-country bus journey of countercultural iconKen Kesey and his Merry Pranksters, shows the travelers developing a form of tie-dye by taking LSD beside a pond and pouring enamel-based model airplane paint into it, before placing a white T-shirt upon the surface of the water. Although the process is closer to paper marbling, in the accompanying narrative, the travelers claim credit for inventing tie-dyeing.

Tie-dying, particularly after the introduction of affordable Rit dyes, became popular as a cheap and accessible way to customise inexpensive T-shirts, singlets, dresses, jeans, army surplus clothing, and other garments into psychedelic creations. Some of the leading names in tie-dye at this time were Water Baby Dye Works (run by Ann Thomas and Maureen Mubeem), Bert Bliss, and Up Tied, the latter winning a Coty Award for "major creativity in fabrics" in 1970. Up Tied created tie-dyed velvets and silk chiffons which were used for exclusive one-of-a-kind garments by Halston, Donald Brooks, and Gayle Kirkpatrick, whilst another tie-dyer, Smooth Tooth Inc. dyed garments for Dior and Jonathan Logan. In late 1960s London, Gordon Deighton created tie-dyed shirts and trousers for young fashionable men which he sold through the Simpsons of Piccadilly department store in London.

MATERIAL AND METHODOLOGY

Methodology

Aim: The main aim of this case study is to understand what is milk fabric and to apply a dyeing procedure. In this case, ‘Tie & Dye’ method has been used to give colour to the scarf with the help of acid dyeing.

Objective:.

- To dye the knitted fabric using Acid dyes using the technique of Tie and Dye
- To evaluate colour fastness of the dyed knitted fabric
- Development of knitted scarf

Scope of the Study:

The market for milk fabric scarf using Acid dye by using tie & dye method with the lace work at the edges gives the wearer full comfort due to present climate condition. The scope of the study is to attract the customers towards the dyed milk fabric scarf. For the ladies who wear gives an attractive look, and makes them very unique in appearance.

Procedure:

Market survey was carried out to study the preference of girls (18 to 25yrs) regarding milk fabric and dyeing them using " TIE & DYE" method by applying Acid Dyeing on the Scarf..

According to the weight of the material the dye powder is taken added. The ratio of acid taken 1:40 and the liquor taken is 1:40. Dyeing is done at temperature of 60-70 degree celeius for approximately for 1hour 15mins

Grey scales

Color	Rubbing fastness rating
Maroon	4-5
Brown	4
Blue	4-5
Pink	3-4
Yellow	4

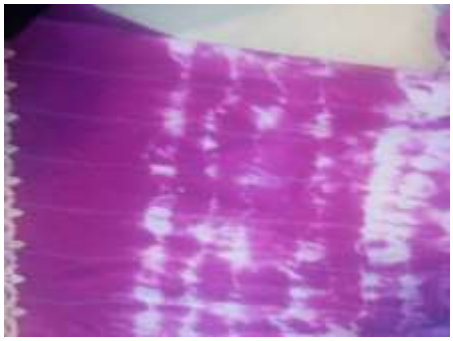
Color	Rubbing fastness rating	
Maroon	2/3	
Brown	1/2	
Blue	2/3	
Pink	2/3	
Yellow		

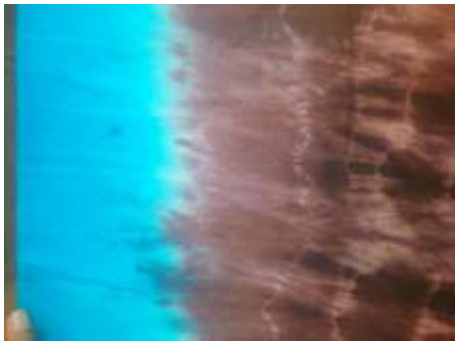
DESIGN NO: 1

To enhance the overall look of the scarf, I have finished the edges of the scarf with lace. Keeping the summer collection in mind, Tie & Die method has been used to bring out the bright & colourful features in the scarf by using the colors like Pink, Blue and Brown.

SPECIFICATION SHEET -01

Date :05.12.2013	Design no :001
Description : Women's Scarf with lacework	Fabric :Milk Casein
Season : Spring/Fall	Dyeing : Acid dye, Tie & Dye method
Size ranges : Free size	Color : Brown, Blue,Pink





Cost sheet for design no- 01

	QTY	PRICE / UNIT (INR)	TOTAL COST (INR)
Material			
Milk Casein Fabric	1/2	800	400
Total material cost			**400**
Trims and accessories			
Threads	1	5	5
Dyeing	10g	60	60
Lace	1	35	35
Total Cost			**100**
Labor cost			
Labor cost		150	150
Total Labor cost			**150**
Overall cost			**650**

PHOTOGRAPH NO1

DESIGN NO: 2

To enhance the overall look of the scarf, I have finished the edges of the scarf with lace. Keeping the summer collection in mind, Tie & Die method has been used to bring out the bright & colourful features in the scarf by using the colors like Pink and Yellow.

SPECIFICATION SHEET -02

Date :05.12.2013	Design no :002
Description : Women's Scarf with lacework	Fabric :Milk Casein
Season : Spring/Fall	Dyeing : Acid dye, Tie & Dye method
Size ranges : Free size	Color : Yellow, Pink
	

Cost sheet for design no- 02

	QTY	PRICE / UNIT (INR)	TOTAL COST (INR)
Material			
Milk Casein Fabric	1/2	800	400
Total material cost			**400**
Trims and accessories			
Threads	1	5	5
Dyeing	10g	50	50
Lace	1	25	25
Total Cost			**80**
Labor cost			
Labor cost		150	150
Total Labor cost			**150**
Overall cost			**630**

PHOTOGRAPH NO 2

DESIGN NO: 3

To enhance the overall look of the scarf, I have finished the edges of the scarf with lace. Keeping the summer collection in mind, Tie & Die method has been used to bring out the bright & colourful features in the scarf by using the colors like Maroon, Blue and Brown.

SPECIFICATION SHEET -03

Date :05.12.2013	Design no :003
Description : Women's Scarf with Bead work	Fabric :Milk Casein
Season : Spring/Fall	Dyeing : Acid dye, Tie & Dye method
Size ranges : Free size	Color : Brown, Blue, Marron

Cost sheet for design no- 03

	QTY	PRICE / UNIT (INR)	TOTAL COST (INR)
Material			
Milk Casein Fabric	1/2	800	400
Total material cost			**400**
Trims and accessories			
Threads	1	5	5
Dyeing	10g	50	50
Beads	3.5	32	112
Total Cost			**167**
Labor cost			
Labor cost		150	150
Total Labor cost			**150**
Overall cost			**717**

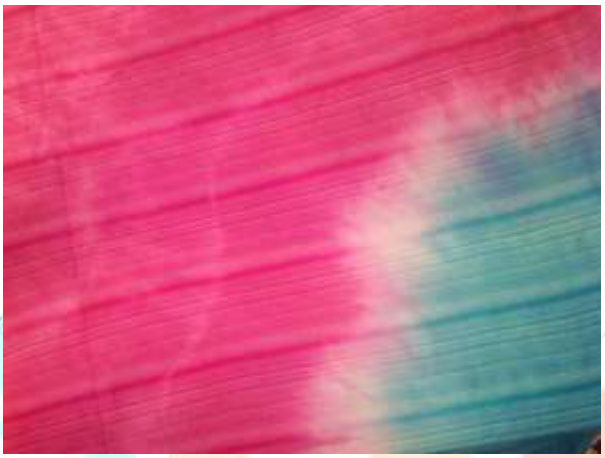
PHOTOGHARPH NO 3

DESIGN NO: 4

To enhance the overall look of the scarf, I have finished the edges of the scarf with lace. Keeping the summer collection in mind, Tie & Die method has been used to bring out the bright & colourful features in the scarf by using the colors like Pink and Blue.

SPECIFICATION SHEET -04

Date :05.12.2013	Design no :004
Description : Women's Scarf with lacework	Fabric :Milk Casein
Season : Spring/Fall	Dyeing : Acid dye, Tie & Dye method
Size ranges : Free size	Color :Blue, Pink



Cost sheet for design no- 04

	QTY	PRICE / UNIT (INR)	TOTAL COST (INR)
Material			
Milk Casein Fabric	1/2	800	400
Total material cost			**400**
Trims and accessories			

Threads	1	5	5
Dyeing	10g	50	50
Lace	3.5	45	157.5
Total Cost			**212.5**
Labor cost			
Labor cost		150	150
Total Labor cost			**150**
Overall cost			**762.5**

PHOTOGRAPH NO 4

RESULT AND DISCUSSION

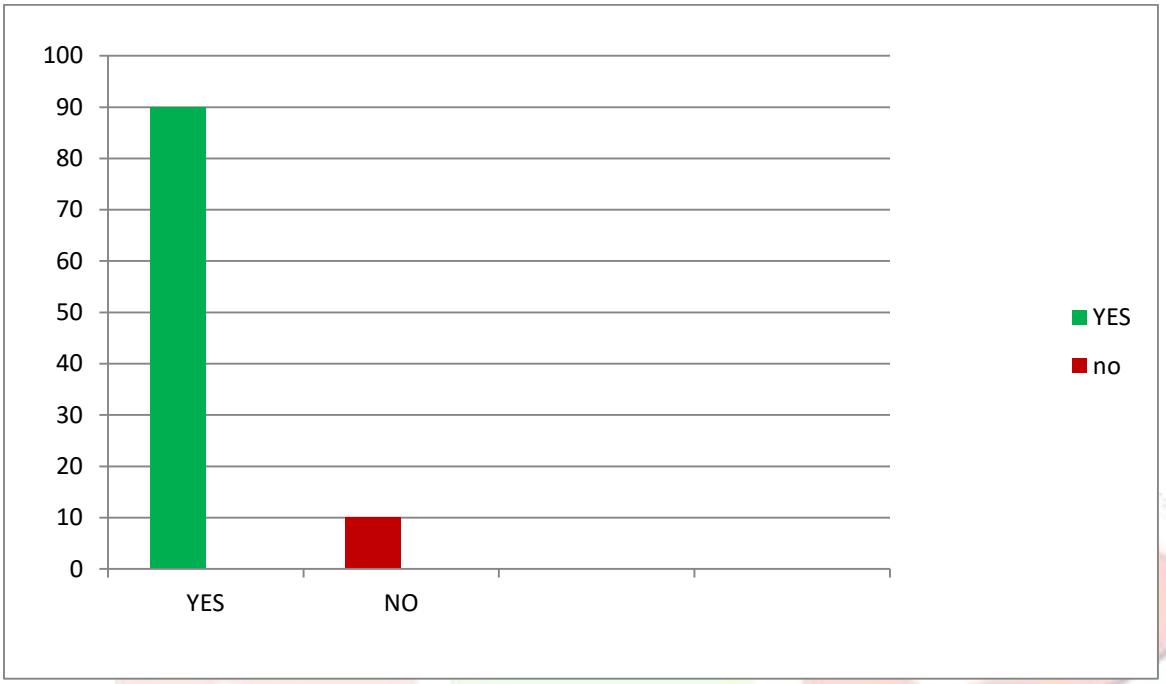
General survey to study the preference of girls (18 to 25yrs) regarding a Scarf made of Milk Casein Fabric

Q1. Are you aware of Milk Casein Fabric.

TABLE NO: 6.1

Options	Number of customers	Percentage
Yes	27	90%
No	3	10%

GRAPH NO: 6.2



Analysis:

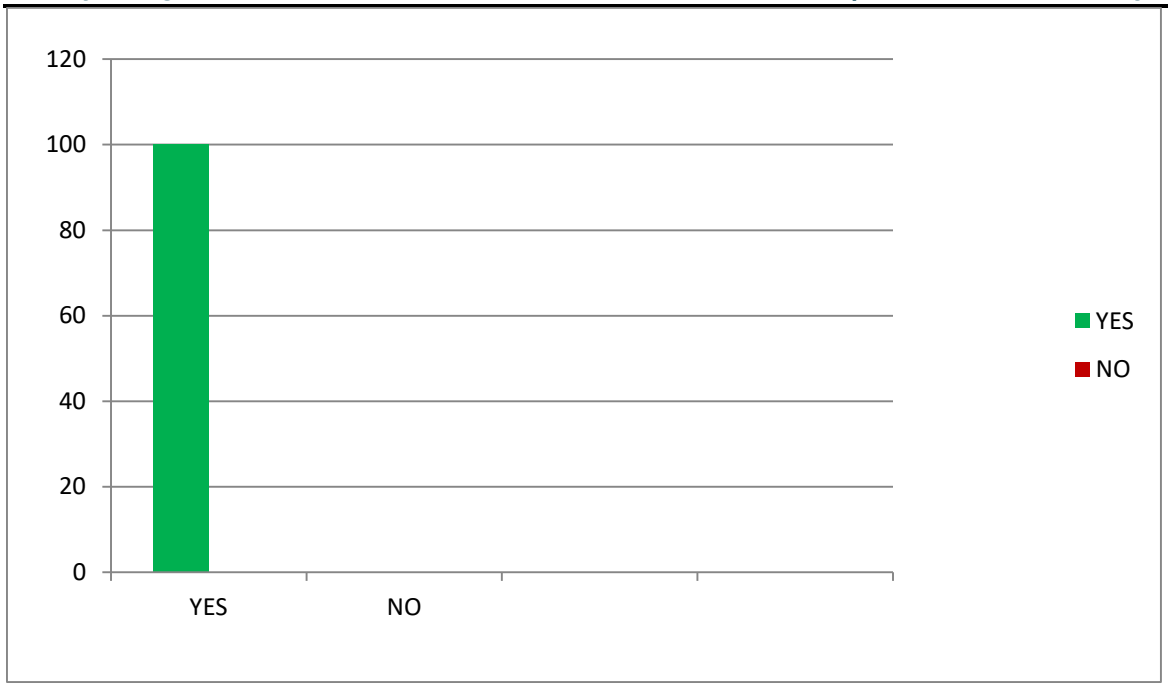
According to the above chart it is clear that majority of customers accepted the scarf with milk fabric. They show the percentage of 90% and 10% didn't accept it.

Q2. Do you prefer scarf with new concept and materials.

TABLE NO: 7.1

Options	Number of customers	Percentage
Yes	30	100%
No	00	0%

GRAPH NO: 7.2



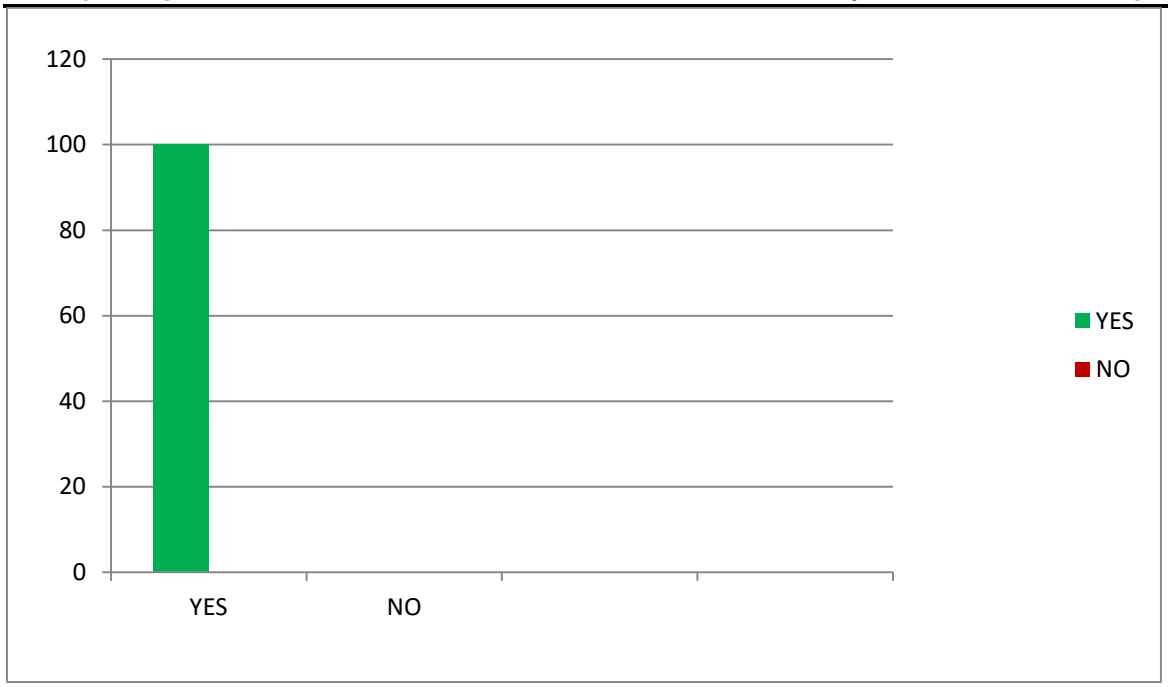
Analysis:

According to above chart Percentage of 100% of people prefer a scarf with new concept and materials.

Q3. Have you heard of scarf made up of Milk Fabric

Options	Number of customers	Percentage
Yes	30	100%
No	00	0%

GRAPH NO: 7.2



Q4. What are the factors you consider while selecting casual wear for yourself?

TABLE NO: 8.1

Options	Number of customers	Percentage
Color	9	30%
Style	13	43.3%
Price	3	10%
Material	5	16.6%

GRAPH NO: 8.2

Analysis:

According to above chart style and color are the factors which affect the purchase behavior by group of customers.

Material and price are the fewer factors which affects the purchase behavior by customer.

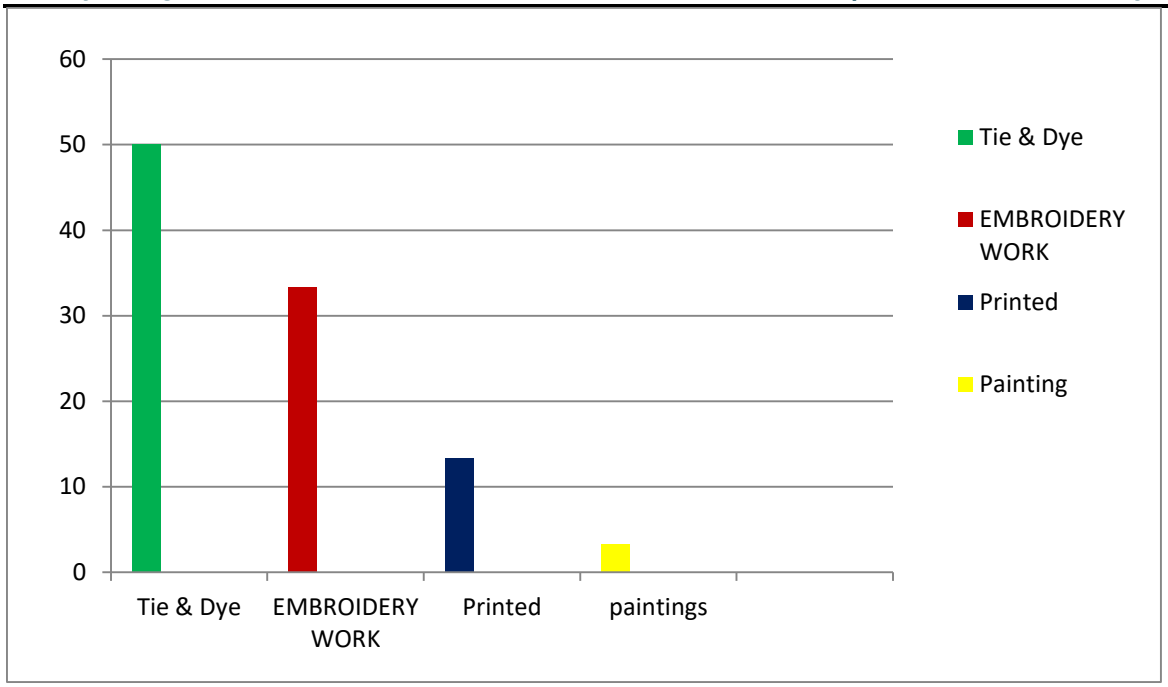
There for it can be concluded as that "STYLE AND COLOR" are the most popular opinion in deciding the customer view about factor affecting the purchase behavior.

Q5.What kind of embellishment do you prefer on the scarf?

TABLE NO: 9.1

Options	Number of customers	Percentage
Tie and Dye	15	50%
Embroidery work	10	33.3%
printed	4	13.3%
Other	1	3.3%

GRAPH NO: 9.2



Analysis:

According to the above chart option one the most popular choice among its group of customers.

Embroidery work and Printed work has been accepted by an average people of customers.

Therefore it can be concluded that "TIE & DYE" accepted by a percentage of 50% as an embellishment for the Scarf.

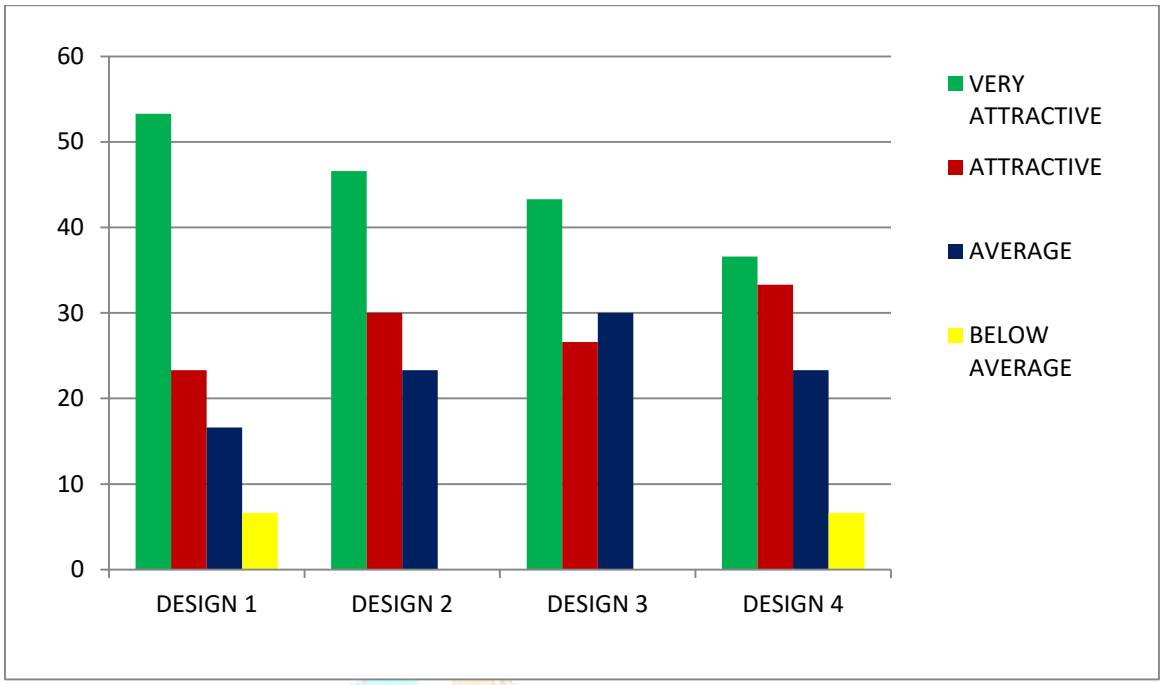
Q6. How do you rate the dyeing of Scarf?

TABLE NO: 11.1

Options		Number of customers	Percentage
DESIGN 1	Very Attractive	16	53.3%
	Attractive	7	23.3%
	Average	5	16.6%
	Below Average	2	6.6%
DESIGN 2	Very Attractive	14	46.6%
	Attractive	9	30%
	Average	7	23.3%
	Below Average	0	0%
DESIGN 3	Very Attractive	13	43.3%
	Attractive	8	26.6%
	Average	9	30%
	Below Average	0	0%

DESIGN4	Very Attractive	11	36.6%
	Attractive	10	33.3%
	Average	7	23.3%
	Below Average	2	6.6%

GRAPH NO: 11.2



Analysis:

According to the above chart it is clear that DESIGN 1 mostly accepted under the category of "VERY ATTRACTIVE" by the group of customers.

According to the above chart it is clear that DESIGN 2 mostly accepted under the category of "VERY ATTRACTIVE" by the group of customers

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According to the above chart it is clear that DESIGN 3 mostly accepted under the category of "VERY ATTRACTIVE" by the group of customers.

According to the above chart it is clear that DESIGN 4 mostly accepted under the category of "VERY ATTRACTIVE" by the group of customers.

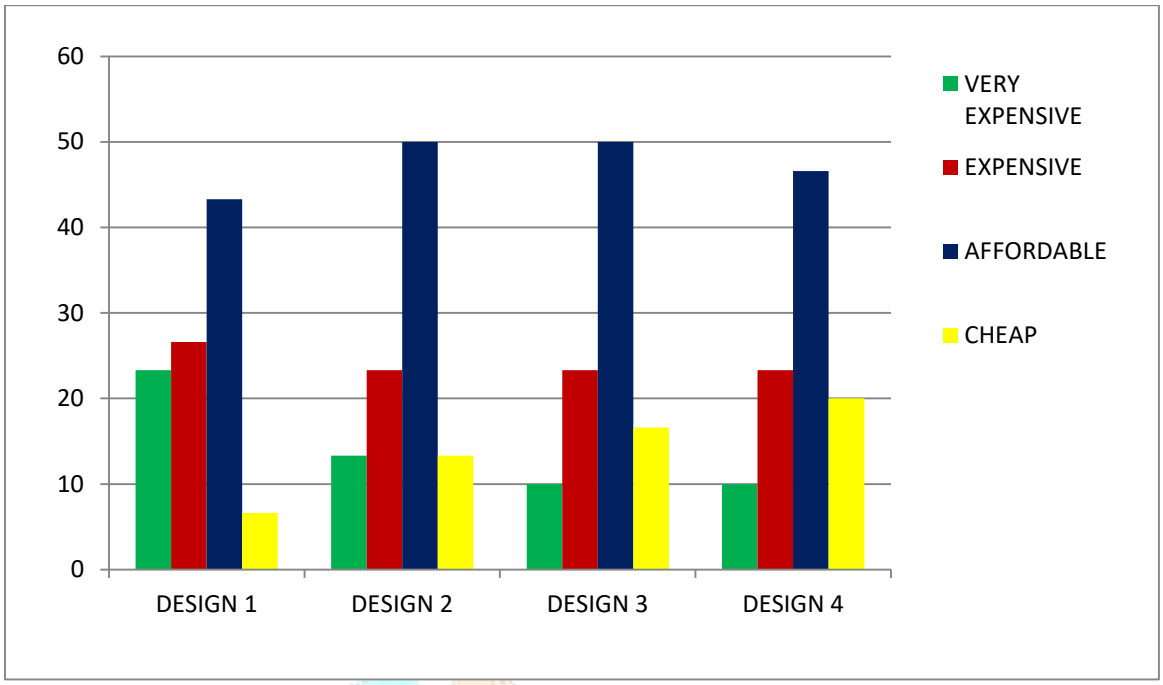
Q7. How do you rate the price ranges?

TABLE NO: 14.1

Options		Number of customers	Percentage
DESIGN 1	Very Expensive	7	23.3%
	Expensive	8	26.6%
	Affordable	13	43.3%
	Cheap	2	6.6%

DESIGN 2	Very Expensive	4	13.3%
	Expensive	7	23.3%
	Affordable	15	50%
	Cheap	4	13.3%
DESIGN 3	Very Expensive	3	10%
	Expensive	7	23.3%
	Affordable	15	50%
	Cheap	5	16.6%
DESIGN4	Very Expensive	3	10%
	Expensive	7	23.3%
	Affordable	14	46.6%
	Cheap	6	20%

GRAPH NO: 14.2



Analysis:

According to the above chart it is clear that DESIGN 1 mostly accepted under the category of "AFFORDABLE" by the group of customers.

According to the above chart it is clear that DESIGN 2 mostly accepted under the category of "AFFORDABLE" by the group of customers

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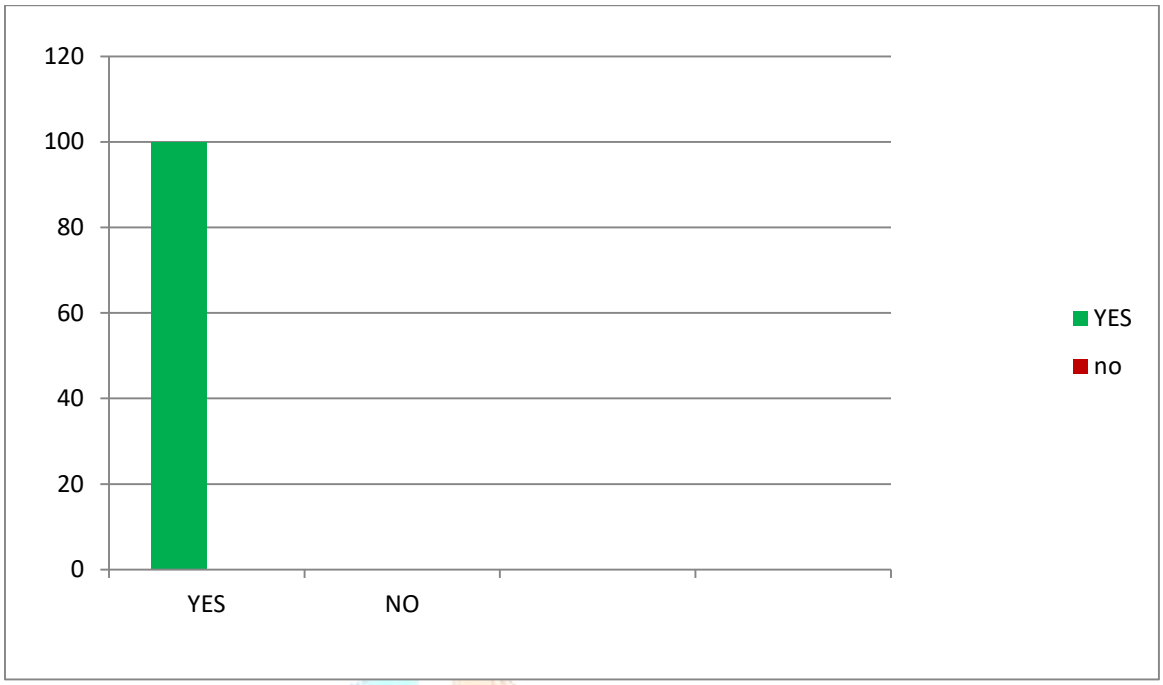
According to the above chart it is clear that DESIGN 3 mostly accepted under the category of "AFFORDABLE" by the group of customers.

According to the above chart it is clear that DESIGN 4 mostly accepted under the category of "AFFORDABLE" by the group of customers.

Q8 . Is this collection suitable to the modern trend of fashion?

Options	Number of customers	Percentage
Yes	30	100%
No	00	0%

GRAPH NO: 6.2



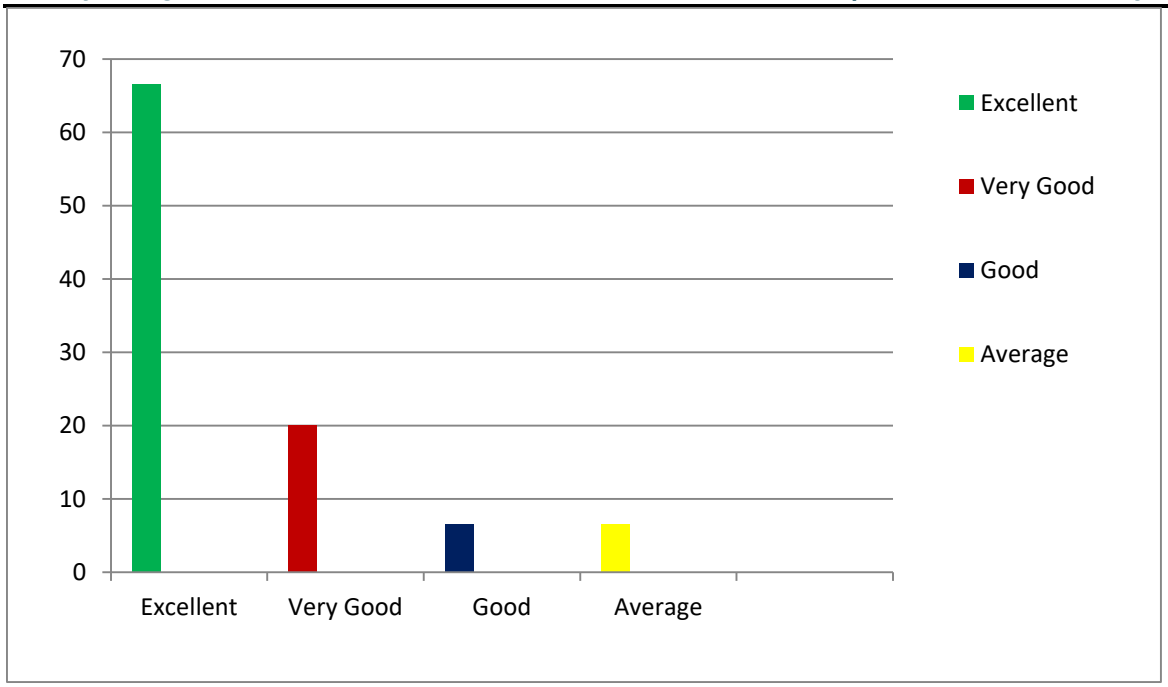
Analysis:

According to the above chart it is clear that majority of customers accepted the scarf with milk fabric belongs to the modern trend of fashion.

Q9 . What did you feel about my scarf collections?

Options	Number of customers	Percentage
Excellent	20	66.6%
Very Good	6	20%
Good	2	6.6%
Average	2	6.6%

GRAPH NO: 15.2



Analysis:

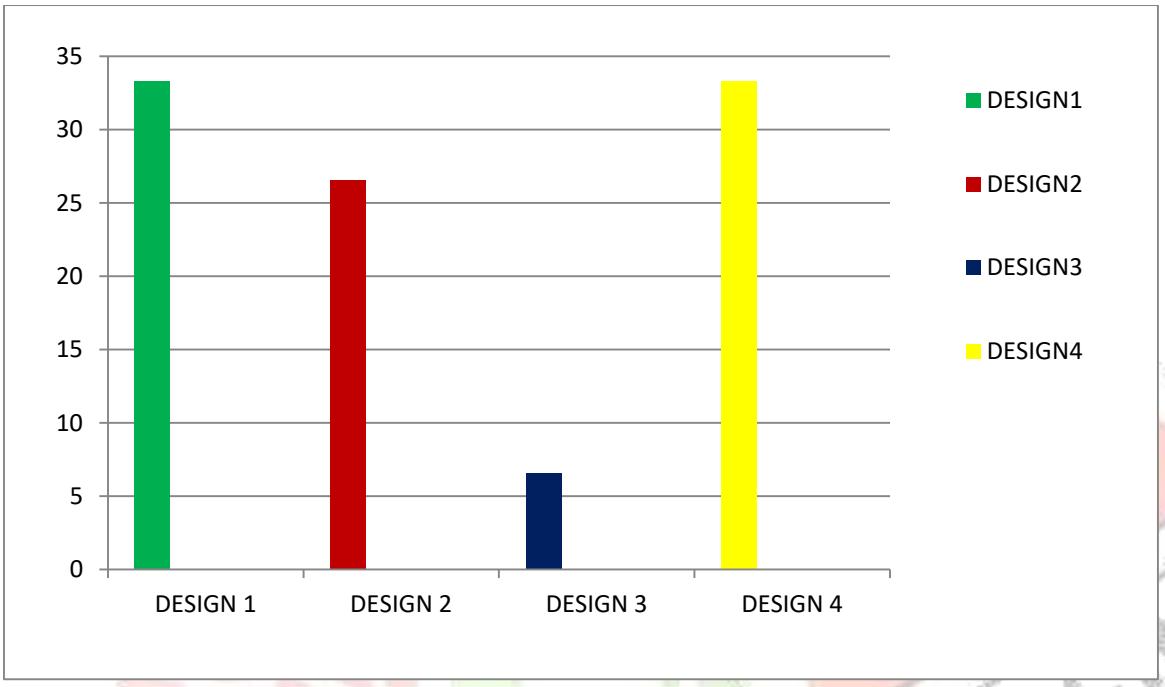
According to above chart it is clear that ,it is the " EXCELLENT" collection of scarf with the milk fabric in the market.

Q10. Which one would you rate as your favorite?

TABLE NO: 15.1

Options	Number of customers	Percentage
DESIGN 1	10	33.3%
DESIGN 2	8	26.6%
DESIGN 3	2	6.6%
DESIGN 4	10	33.3%

GRAPH NO: 15.2



Analysis:

According to above chart it is clear that DESIGN 1,2 and 4 is the most accepted choices among its group of customers.

According to above chart it is clear that DESIGN 3 are less accepted by the group of customers.

CONCLUSION

Design is the arrangement of elements within a given style and format. And designers are always responded according to the changing tastes in art, fashion and society. Fashion designing continues to be of high standard and designers have been able to successfully meet up with changing trends within the industry, such as development in fabrics as well as surface ornamentation methods, invention of new accessories etc. All these improvements have helped to bring a new dimension of highly fashionable styles for apparels and accessories, for the consumer who is on the look out of the glamour and shine at an affordable price.

. The main aim of the study is to analyze the new trends of women's scarf using different materials. The market for the women's scarf in the world is highly developed, but there are only few designs. The scope of the study is to create a bigger variety for the future market with designs consisting of elegant appearance. The collection for women is being designed for the present and future use in daywear. The scarf material which is milk fabric gives the elegant look to the scarf.

According to the survey most of the respondent observed Style, Color and Material are the factors that make the customer to choose a scarf. Also most of them accepted tie & dye and lace work on scarf.

They choose the suitable material for scarf with milk casein fabric. The cost of the products was accepted by the majority as affordable comparing each other with the particular dyeing done on the surface.

The market survey done among the age group of 18 – 25 yrs ladies was interesting according to the feedback and response of them as they were college students and working girls.

Finally After the market survey the conclusion was that design 1 was the most accepted by the majority of customers and other designs also average accepted by the customers. As to conclude I can say the future consumers seek innovative designs from the designers which is very comfortable and attractive.

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QUESTIONNAIRES

Name:

Age: **Profession:**

1. Are you aware of milk casein fabric.

    a) Yes
    b) No

2. Do you prefer scarf with new concept and materials.

    a) Yes
    b) No

3. Have you heard of scarf made up of milk fabric?

    a) Yes
    b) no

4. What are the factors you consider while selecting scarf for yourself?

    a) Colour
    b) Price
    c) Style

d) Material

5. What kind of emblishment do you prefer on the scarf?

a) Tie & dye
b) Embroidery work
c) Printed
d) Paintings

6. How do rate the dyeing of the scarf.

DESIGN 1

a) Very attractive
b) Attractive
c) Average
d) Below average

DESIGN 2

a) Very attractive
b) Attractive
c) Average
d) Below average

DESIGN 3

a) Very attractive
b) Attractive
c) Average
d) Below average

DESIGN 4

a) Very attractive
b) Attractive
c) Average
d) Below average

7. How do you rate the cost?

DESIGN1

a) Very expensive

b) Expensive
c) Affordable
d) Cheap

DESIGN 2

a) Very expensive
b) Expensive
c) Affordable
d) Cheap

DESIGN 3

a) Very expensive
b) Expensive
c) Affordable
d) Cheap

DESIGN 4

a) Very expensive
b) Expensive
c) Affordable
d) Cheap

8. Is this collection suitable to the modern trend of fashion ?

a) Yes
b) No

9. What did you feel about my scarf collection?

a) Excellent
b) Very good
c) Good

d) Average

10. Which ofthe design did you like most from this collection?

a) Design 1
b) Design 2
c) Design 3
d) Design 4

APPENDIX

Fig 1.1

Fig 1.2