



EFFECT OF DIFFERENT DETERGENT OF COLOURFASTNESS PROPERTIES OF REACTIVE DYED COTTON FABRIC

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Abstract :

Currently, cotton is the world's most used fiber. Cotton is a natural fiber and is used in a wide variety of clothing and home furnishings. It is a natural fiber which is obtained from cotton linters. The cotton is a relatively pure and inexpensive source of cellulose. Cotton has a combination of desirable properties which makes it suitable for many uses. It has properties of low cost, low resiliency, launderability and absorbency. The low cost is perhaps one factor which led to the wide use of cotton for textiles. Cotton is grown in all parts of the world where the climate is mild. The quality of cotton is based on length and brightness of the fiber - the longer, brighter fibers being best. Cotton is easily washed and/or dry cleaned. Cotton is a good strong fabric that is absorbent, and easy to work with. Cotton's strength increases approximately 25% when wet, which is important in washing and ironing. The strength of cotton is improved by treating with caustic soda, the process called mercerization also increases its luster and affinity for dyes.

In the present study three different brands of detergent ie. Ariel, Surf Excel and Wheel were used and reactive dyed cotton fabric was used. The colourfastness to washing and rubbing was determined for the cotton fabric samples dyes with reactive dyes (Pink and Orange colour).

Keywords : Cotton, Reactive Dye, colourfastness, rubbing, detergent.

Introduction :

Cotton is a part of our daily lives from the time we dry our faces on a soft cotton towel in the morning until we slide between fresh cotton sheets at night. It has hundreds of uses, from blue jeans to shoe strings. Clothing and household items are the largest uses, but industrial products account from many thousands of bales. The utility of cotton fiber for clothing purpose warranted that it can be coloured and further can be used to fulfill different purpose by man. However, the reuse of such clothes was dependent on the ability of the cloth to withstand different process of dyeing as well as washing, which involved use of chemical compounds.

The end point for formulators for laundry detergents is consumer satisfaction. Thus, it is evident that the cleaning property of detergents as well as the nature of different dyes provides a dynamic situation that demands careful planning for the washing process for sustaining the quality of fabrics. In the backdrop of above information, this study was carried out to assess the impact of different commercially available laundry detergents on colour fastness of dyed cotton fabrics. The researcher was motivated to carry out research in this domain as it offers significant potential benefits through a closer understanding with the effectiveness of the detergents, which are an essential commodity of human life.

Objectives of the study :

1. To standardize the dyeing procedure by using 100% branded cotton fabrics.
2. To observe the effect of color fading of the dyed fabric in the process of laundering.
3. To suggest the most effective laundry detergent based on its property of color fastness.

MATERIALS AND METHODS :

Selection of detergent:

Three different brands of detergents, Ariel (Ar), Surf Excel(SE), and Wheel(Wh) were used in this study. These washing powders is manufactured and sold by the retail company. Each detergent is a well-known detergent, available at most supermarkets and retail shops.

Experimental Fabrics :

100% Cotton (Poplin) fabric was use in this study. The fabric was scoured and subjected to drying.

Dyes :

For this study Reactive dye, a) Orange Colour and b) Pink Colour was selected.

Methods Followed :

The cotton fabrics were dyed in a different colours, namely Reactive dyes- orange and pink colour. In assessing the colourfastness of experimental fabrics to laundering, tests for colour change as well as staining are important (Merke1, 1991). Greyscale were used during laundering treatments to indicate its possible

staining due to colour loss of experimental fabrics.

Colour fastness of dyed samples : The final dyed samples were subjected to colour fastness tests. The tests conducted were.

- 1) Colour fastness to washing - related standard: ISO:105, BS: 1006:1990
- 2) Colour fastness to crocking related - standard: IS: 776:1988 and ISO: 105/X-1984

Grey Scale for assessing change in shade/colour : ISO 105-A02

Grey Scale for assessing Staining : ISO 105-A03

RESULT AND DISCUSSION:

Fastness to washing Test Report :

Reactive dyed Pink colour

(Change in colour shade)

Temperture	Ariel	Surf Excel	Wheel
Room Temp.	5	5	5
40 °C Temp.	5	5	5
60 °C Temp.	5	5	5

Reactive dyed Pink colour

(Stain on White cotton fabric)

Temperture	Ariel	Surf Excel	Wheel
Room Temp.	5	5	5
40 °C Temp.	5	5	5
60 °C Temp.	5	5	5

Reactive dyed Orange colour

(Change in colour shade)

Temperture	Ariel	Surf Excel	Wheel
Room Temp.	5	5	5
40 °C Temp.	5	5	5
60 °C Temp.	5	5	5

Reactive dyed Orange colour

(Stain on White cotton fabric)

Temperture	Ariel	Surf Excel	Wheel
Room Temp.	5	5	5
40 °C Temp.	5	5	5
60 °C Temp.	4-5	4-5	4-5

Reactive Dyes

- **Reactive dyes Pink and Orange:** The study results pertaining to grayscale rating for change in colour shade (for reactive dyes pink and orange) did not indicate any colour bleeding, which was evident from the high grayscale scores i.e. 5. Furthermore, robust colour fastness was also evident at all the setting temperatures selected (room temperature, 40°C and 60°C) in this study. Thus, it may be concluded from the study results that the reactive dyes pink and orange dyed cotton fabrics were good in colourfastness.

In addition to above, the result pertaining to the staining of above mentioned dyes on the white

cotton was also assessed using grayscale for stain on white cotton. The tests indicated that the

- The reactive (pink and orange) dyed cotton fabrics also indicated strong colourfastness property; however, the white cotton did indicate slight staining (grayscale rating of 4-5 for stain on white cotton) with the Reactive dye Orange colour bled from the dyed cotton fabric.

Colour Fastness to rubbing test result: (Mean Value)

	Dry Rubbing	Wet Rubbing
Reactive dye Pink Colour	5	4-5
Reactive dye Orange colour	5	5

Table shows information pertaining to dry rubbing fastness of cotton fabrics dyed with reactive dye pink, and reactive dye orange indicated rating of 5 for dry rubbing fastness. The result of dry rubbing fastness were found to be good as compared to wet rubbing fastness.

CONCLUSION:

The study results pertaining to gray scale rating for change in colour shade did not indicate any colour bleeding, hence, it can be concluded that the reactive dyes pink and orange dyed cotton fabrics are good in colourfastness. On the rubbing fastness study results it can be concluded that the result of dry rubbing fastness were found to be good as compared to wet rubbing fastness.

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