EVALUATION OF BASE AND HYGROSCOPIC AGENT CONCENTRATION FOR INDIGO VAT DYE PRINT ON DIFFERENT CELLULOSE FABRIC

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Introduction:
Three major style of printing: direct style printing, discharge style printing, and resist style of printing. Most popular style of printing is direct style with screen printing method.

Literature Review:
Screen printing:

Fabric preparation:
Coloring matter: Printing has been achieved by means of coloring matter like dyes, prints, and ink (Kinsey, 1968)

Indigo dye

Methodology:
Apparatus, and chemicals

Thickener: There are wide varieties of thickeners available in the market to print on the cloth such as seaweed, wheat starch gum, natural printing gum (Kosloff, 1966).

Hygroscopic agent: Glycerin is not compatible with the indigo vat dyes, where urea and soda ash gives better results on indigo print process (Garb, 2013).

Reducing agent: Reducing agent is used to help to remove the oxygen from the indigo vat dye paste. Sugar cane act as reducing agents in nature (Garb, 2013)

Base (Lime): Base are helpful to improve of reducing agent in printing paste.

PH: PH value should be maintained throughout the print application, which was help to developed the bond of the indigo vat dye with the cotton fabric structure.

Colorfastness test: According to AATCC (1921), colorfastness to washing 107/2002 test method, is applicable on printed fabric to evaluate the bleeding of color on backed fabric.

Hypothesis: Part I: To developed the optimum recipe for indigo vat dye printing paste, with different concentration of hydroscopic agent (soda ash) and base (calcium hydroxide) to help the natural reducing agent (jaggery).

Part II: A. Further, evaluated print paste has to developed on the large motif are of Hemp, Linen, and mercerized cotton.

C. Evaluated the washing fastness properties of printed sample as per the AATCC standards.

Result and Discussion:

Part I: lime concentration scale reading

<table>
<thead>
<tr>
<th>lime concentration</th>
<th>scale reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5gm</td>
<td>2-3</td>
</tr>
<tr>
<td>1.0gm</td>
<td>3-4</td>
</tr>
<tr>
<td>1.5gm</td>
<td>4</td>
</tr>
</tbody>
</table>

Part II: soda ash concentration scale reading

<table>
<thead>
<tr>
<th>soda ash concentration</th>
<th>scale reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5gm</td>
<td>4</td>
</tr>
<tr>
<td>1.0gm</td>
<td>3-4</td>
</tr>
<tr>
<td>1.5gm</td>
<td>3</td>
</tr>
</tbody>
</table>

Evaluation:

Methodology:


Thickener natural printing gum paste preparation:

To make the natural gum thicker paste 3%concentration

Natural printing gum =6.0gm Water =200ml

Printing recipe:

Hygroscopic Agent (Soda Ash) =0.5gm

Jaggery solution =0.8gm

Thicker Paste =10.0gm

Indigo Vat Dye =0.2gm

Base-lime solution (LS) =0.5gm

Part II: Raw cotton, Cotton M400, Hemp 100, and Linen 61 was used for print.

Printing recipe:

Lime Solution (LS) =1.5gm and Soda Ash = 0.5 gm was used for cellulosic fabric, where as rest of the recipe quantity was same.

Conclusion:

Part I: The result shows that, as on base (lime) concentration are increased and hygroscopic agent concentration are decreased the colorfastness to water has been improved

Part II: The designed recipe has been well suitable for Cotton M 400 instead of Linen 61 and Hemp 100 fabric samples.