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CHAPTERIII: RESULT AND DISCUSSION

Summary

Dyeing formulations for Nylon/Cotton blends very difficult and can involve a different dye class for each component in one or two baths. The dyeing process is complicated by the difference in reactivates of these two fibers. When dyeing Nylon and Cotton in the same bath there is preferential dye uptake by nylon, in the final, color correction may be required for union shades. These difficulties in wet processing of Nylon /cotton blends including dyeing to union shades impeded their constant market share many investigations are achieved to concede the cotton chemically modifying with amino or quaternary ammonium groups functionality which make the cotton dye similarly to nylon in a nylon dye bath. This system suggests easy processing with one dye in one bath provided Nylon and cotton an equally competitive for the anionic nylon dyes under acidic condition.

The implementation of union dyeing should help promote Nylon /cotton and lead ultimately to more favorable marked position.

In this work union dyeing for Nylon /cotton blend fabric was achieved using one dye (acid dye or direct dye) and one bath through a chemical modification of the cotton via a one of the cationizing agent.

Chemical modification of Nylon / cotton blended fabric:

Blended samples were treated with anionic and cationic materials to produce ionic cellulose. This approach gave us the opportunity of forming ionic cross-links with cationic materials.

- Blending of cotton Giza 89 with nylon 6 / 6 by different blending rates are as follows:

100% Cotton, 75% Cotton: 25% Nylon, 50% Cotton: 50% Nylon, 25% Cotton: 75% Nylon, 100% Nylon.

- The treatment of all blending with chloroacetic-acid and the treatment bath was containing 2.5% of the chloro acetic acid in PH 7, L: R 1:15.
- Then the samples were divided into three sections ,the first part of the samples was treated with (Egyfix1) and the treatment bath was containing 2.5% of (Egyfix1) in PH 7, L: R 1:15.
- The second part of the samples was treated with chitosan and the treatment bath was containing 2.5% of chitosan in PH 7, L: R 1:15.
- As to the third part of the samples was treated with Magnesium chloride and the treatment bath was containing 2.5% of Magnesium chloride in PH 7, L: R 1:15.

The results showed the following:

Results of color measurements of Nylon /Cotton blended samples

- The result proved that when using the acid dye there was a higher K/S (color strength) value for treated samples (25C:75N).
- Also the result proved that when using the direct dye there was a higher K/S (color strength) value for treated samples (75C:25N).
- It was noted that the highest value of K/S (color strength) was to sample (25C:75N) treated with chitosan and the lowest value was to sample (100%C) treated with chloro -acetic acid.
- The highest value of K/S (color strength) dyed with direct dye was to sample (75C:25N) treated with magnesium chloride t and the lowest value of the sample (100%C) treated with magnesium chloride.

Results of mechanical properties of Nylon /Cotton blended samples

- The result proved that when using the acid dye there was a higher value of mechanical properties for treated samples (25C:75N).
- Also the result proved that when using the direct dye there was a higher value of mechanical properties for treated samples (75C:25N).

- When using the acid dye was observed that the highest value in the bursting strength for the sample (25C:75N) treatment with chitosan and lowest value for the sample (100%C) treated with magnesium chloride and the highest value in thickness test are equal in all treatments for the sample (25C:75N) and the lowest value for the sample (100%C) treated with (Egyfix1) and the highest value in the air permeability test of the sample (25C:75N) treated with chitosan and the lowest value for the sample (100%C) treated with chloro-acetic acid and The highest value in abrasion test of the sample (25C:75N) treated with magnesium chloride and the lowest value for the sample (100%C) treated with (Egyfix1).
- And when using the direct dye was observed that the highest value in the bursting strength for the sample (25C:75N) treatment with chitosan and lowest value for the sample (100%C) treated with chloro-acetic acid and the highest value in thickness test equal in all treatments for the sample (25C:75N) and the lowest value in all treatments for sample (100%C) and The highest value in the air permeability test of the sample (25C:75N) treated with chitosan and the lowest value for the sample (100%C) treated with chloro-acetic acid and the highest value in abrasion test of the sample (25C:75N) treated

with magnesium chloride and the lowest value for the sample (100%C) treated with chloro-acetic acid.

Results of the fastness properties of Nylon /Cotton blended samples

Wash fastness gave the similar ratings between 3/4 and 4/5 on treated samples with chitosan, chloro-acetic acid, and magnesium chloride (dyed with acid and direct dyes).

Also fastness to acidic and alkaline perspiration the fastness gave the similar ratings between 3/4 and 4/5 on all treated samples with chitosan, chloro-acetic acid, and magnesium chloride (dyed with acid dye) and fastness to acidic and alkaline perspiration gave the similar ratings between 3/4 and 5 on all treated samples with chitosan, chloro-acetic acid, and magnesium chloride (dyed with direct dyes).

Also light fastness it can be seen from that the light fastness gave the similar ratings between 4/5 and 5 on all treated samples (dyed with acid dye), and the light fastness gave the similar ratings between 3/4 and 4/5 on all treated samples (dyed with direct dye).