

## POLYESTER AND ITS BLENDS – PART XI

REF: TT/ SEPTEMBER 2020 / WK 3

### Cationic Dyeable Polyester or CD-PET fiber

Modification of Polyester fibers has been done to incorporate special properties into it. So that shortcomings of regular polyester fibers such as low moisture regain, static electricity and soiling problems can be overcome. Hence, varieties of modified Polyester fibers have been introduced to meet end-users requirements. Cationic dyeable Polyester or CD-PET fibers are one of those modified polyester that offers various advantages over the regular Polyester fibers. These fibers are mainly used in casual wear, sportswear, jackets, and outerwear product categories.

It is a special Polyester fiber which has undergone a change during polymerization. These fibers have been developed by incorporation of polar sites into the polymer structure to which dye molecules can be attached. These fibers are generally manufactured by introducing a third component containing an anionic sulfonate group during polymerization. CD-PET fibers, thus, can be dyed with cationic dyes. In normal dyeable polyester, there are no sites for ionic dyes. So, it can only be dyed using disperse dyes. Compared to ionic dyes, disperse dyes have small molecular size and lower shade build-up property. So, these dyes cannot give bright and deep colors. Also, wet fastness properties of disperse dyes are relatively poor compared to other classes of dyes. In order to avoid these problems, cationic dyeable polyester was developed.

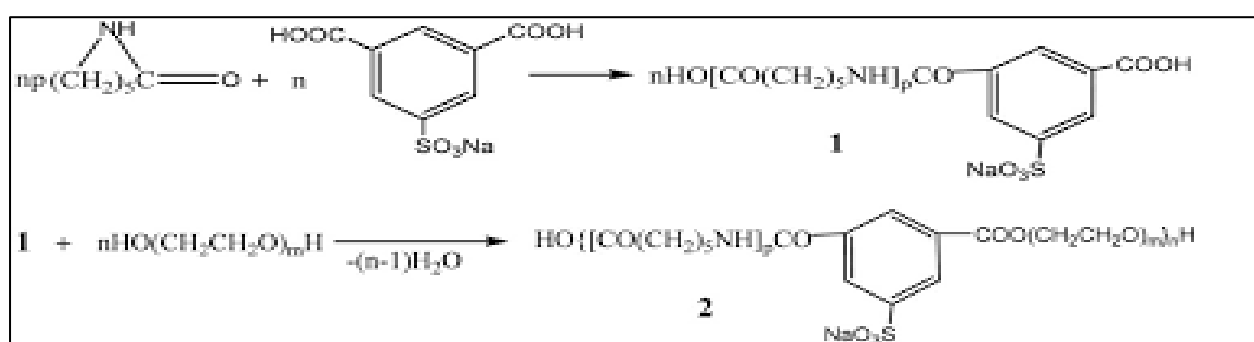


Fig 1.1 Chemical reaction to form Cationic dyeable Polyester fiber

Ref: journals.pagehub.com

Apart from this, CD-PET fibers have 10°C less glass transition temperature (T<sub>g</sub>) than normal Polyester fibers, so to produce an open polymer structure. Due to the variation of fiber structures, these fibers show better dyeability.



**Glass Transition Temperature (Tg)**

- The glass transition temperature is the range of temperature, where the polymer changes from a rigid glassy material to a soft material.

- Glass transition temperature is measured in terms of stiffness.

**Special features of CD-PET fiber**

- CD-PET fibers exhibit deep and brilliant shade development characteristics. This qualifies them to be used in many areas.
- These fibers impart very good dyeing fastness.
- Dyeing can be done under regular pressure and lower temperature than regular polyester.
- Blending with regular polyester creates different color effect.
- Its better moisture absorption capacity makes them suitable for active and sportswear.
- These fibers are strong, hence good wear resistant performance.
- CD-PET fibers have good corrosion resistant, bleaching and mild alkali resistant properties.

**Difference between CD-PET and PET fiber**

- Cationic dyeable or CD-PET fibers exhibit better hygroscopic properties than conventional Polyester fibers.
- They do not generate static electricity as fast as regular polyester fibers do.
- CD-PET fibers have better anti-pilling performance than PET fibers.
- CD-PET has better color fastness properties than regular Polyester fibers.
- On CD-PET deeper shade is achieved while dyed under same dyeing condition.

.....To be continued.....

UNSCRAMBLE THE JUMBLE WORDS
YEDABLE
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Last week`s Answers: 1) ONE BATH 2) REACTIVE 3) ECO FRIENDLY 4) SUPERCRITICAL

Wishing you a great week ahead!

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[arc@resil.com](mailto:arc@resil.com) | [www.resil.com](http://www.resil.com).