TECHNICAL TUESDAYS

PRE-TREATMENT OF DIFFERENT FIBERS – PART XI

REF: TT/ FEBRUARY 2021/ WK 1

Important Parameters of the Scouring Process (Continued..)

1) ***Concentration of Caustic Soda*** – If the caustic soda concentration in the scouring bath is high then the impregnation time required will be less. The fat removal will also be high. Due to the high degree of fat removal, the absorbency will also increase. However, too high concentration will result into reduction in fiber strength and also will cause yellowing of the fiber. This may also result into harshness of the fiber.
2) ***Auxiliaries*** – Surfactants or surface active agents play an important role in scouring process. Precautions should be taken in selecting these agents or chemicals. If the process temperature is above the cloud point of the surfactant, the surfactant may get deposited on the fiber surface. Hence, it is necessary to select a surfactant which has cloud point temperature just above the processing temperature. This gives better result. The cloud point of non-ionic surfactants decreases in the presence of alkalis (Caustic Soda) and electrolytes (Salt). Crypto-non-ionic surfactants do not exhibit a cloud point; they exhibit excellent emulsifying properties of non-ionic along with the good solubility properties of anionic part. Hence, these surfactants are a better choice.
3) ***Temperature*** – Scouring of cotton is done at high temperature. At high temperature, there will be complete removal of fats and waxes.
4) ***Time*** – Recommended time needs to be followed for better performance.

Key Words

- **Surface Active Agents or Surfactants - Chemical substances which reduces surface tension between two liquids, gas-liquid and liquid-solid.**
- **Cloud Point – Temperature at which the mixture starts to separate and becoming cloudy.**
- **Crypto non-ionic Surfactants – Non-ionic surfactants which are capped with anionic group.**

BIO- SCOURING OF COTTON

Alkaline scouring is still commonly used process in the pretreatment of cotton. However, besides removing non- cellulosic components from the fiber, these chemicals also attack the cellulose. Caustic soda works on swelling method and attacks the secondary cell wall of the cotton fiber which is composed mainly of pure cellulose. That reduces the fiber strength and leads to loss of fabric weight. Waste water from these processes also impacts environmental heavily. The waste water has high COD (Chemical Oxygen Demand), BOD (Biological Oxygen Demand) and salt content.

To overcome all these bio-scouring or Enzymatic Scouring methods are developed. Bio-scouring is a process by which alkaline stable pectinase is used to remove pectin and waxes from the cotton fiber. Pectinase hydrolyses pectins present in cotton as a non-cellulosic impurity. Enzymes do not attack the cellulose structure and keeps them almost intact.

The enzymes used in bio-scouring method are those that act on proteins, pectin's and natural waxes to result scouring of cotton.

Advantages of Bio-Scouring over Alkaline Scouring

- Less harsh process conditions - The temperature required for bio scouring is much less than the alkaline one. Thus, reduces the fiber strength loss and also the less effect on handle.
- Wax is removed uniformly in this process. Hence, gives better levelness in dyeing.
- Better result in scouring of blends like silk, wool, viscose, modal, lyocel, and Lycra etc.
- Better handle of the fabric after Scouring.
- Less consumption of utilities.
- Low TDS in discharge.
- Environmental friendly

References:

1. https://scialert.net/
2. https://medcraveonline.com/

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

UNSCRAMBLE THE JUMBLE WORDS
TUREERATEMP
RINGSCOUBIO
GICALBIOLO
OUDCL INTPO

Last week`s Answers: 1) SCOURING 2) SAPONIFICATION 3) EMULSIFICATION 4) PRECIPITATION

Wishing you a great week ahead!

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