

ACRYLIC FIBER

Ms. ALPANA SHAH

ASSOCIATE PROFESSOR

TEXTILES AND CLOTHING

S.M.PATEL COLLEGE OF HOME SCIENCE

VALLABH VIDYANAGAR

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DEFINITION AND CHEMICAL COMPOSITION

- Acrylic is a manufactured fiber in which the fiber-forming substance is a long-chain, synthetic polymer composed of at least 85% by weight of acrylonitrile units.



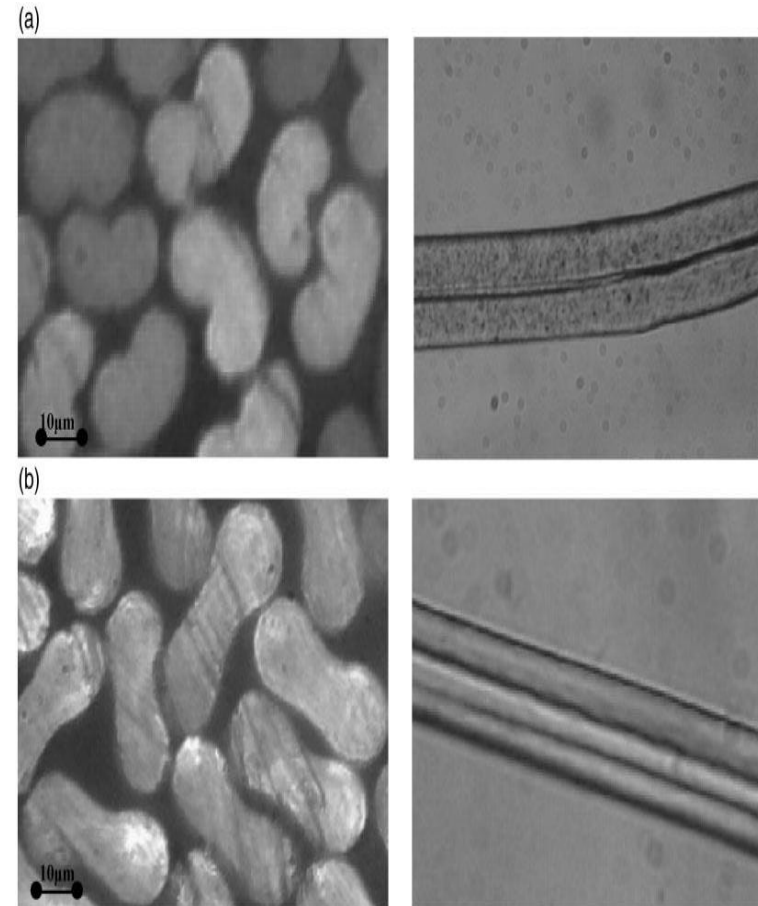
- Modacrylic is a modified acrylic fiber that contains at least 35% and at most 85% [acrylonitrile](#) monomer.
- Acrylic fibers are produced as homopolymer, copolymer and graft polymer.
 - Homopolymer acrylics have 100% polyacrylonitrile and a compact, highly oriented structure but are undyeable
 - Copolymer acrylics have 15% additives, as a result more open structure and are dyeable. Strength of copolymer is less than homopolymer and graft polymer.
 - Graft polymer acrylics have additives are attached as side chains, thus increasing the dyeability due to less crystallinity.

MICROSCOPIC APPEARANCE OF ACRYLICS

- Cross-Sectional View-The methods of manufacturing of the acrylic fibres differ, the appearances vary accordingly. It can be round, multilobal, dogbone and kidney bean shape

1. ACRILAN ACRYLIC: It has a lima bean-shaped cross section, its longitudinal appearance is straight and smooth.
2. ORLON ACRYLIC: It has a flat, nut-shaped
3. CRESLAN ACRYLIC: It has an almost round
4. MOD ACRYLICS: it is of two types verel modacrylic and SEF modacrylic

- Longitudinal View-Smooth surface, uniform diameter, rod-like appearance, some types may have irregularly spaced striations



ACRYLIC:



PROPERTIES

- **Strength:** Strength is satisfactory. Not as durable as nylon and polyester. Dry tenacity is moderate i.e. 2.0 to 3.0g/d. It has moderate abrasion resistance. Wet breaking tenacity is 1.8 to 2.4g/d.
- **Elasticity:** Acrylic fibers have moderate elastic recovery. Elongation increase when fiber is wet.
- **Resiliency:** Acrylic fiber exhibit moderate resiliency and recovery from bending, thus they resist wrinkling during use and care. They have moderate dimensional stability and weathering resistance.
- Acrylic fibers are soft, warm, light weight and bulky.
- **Absorbency:** Acrylic fibers have poor absorbency. Fibers wick moisture to the exterior surface of fabric where it evaporates more readily and cools the body.

- **Washability:** Acrylic shrink when exposed to boiling water, so high temperature and steam should be avoided.
- **Pilling:** Pilling forms on some acrylics. They fibrillate or crack with abrasion.
- **Effect of Heat:** Acrylic fibers are thermoplastic. Does not melt. May discolor after extended exposure to 347°F/175°C. Will ignite at temperatures exceeding 900°F/485°C
- **Shrinkage:** Acrylic fabrics retain their shape and appearance after washing. It has good stability and does not shrink. Acrylic shrinks by about 1.5% when treated with boiling water for 30 min.
- **Effect of Light:** Acrylic fibers have excellent resistance to sunlight.

USE:

- Strong and warm, acrylic fiber is often used for sweaters and tracksuits and as linings for boots and gloves, as well as in furnishing fabrics and carpets.
- End-uses of modacrylic include faux fur, wigs, hair extensions and protective clothing.

CHEMICAL PROPERTIES

Effects of Acids and Alkalis: Good resistance to acids except soluble in nitric acid. Good resistance to weak alkalis, will degrade in strong alkalis.

Effects of Bleaches and Solvents: Resistant to most bleaching solutions. Generally insoluble in most organic solvents. Soluble in some phenolic compounds.

Affinity for dyes: Acrylic fibers are dyed with acid or basic dyes.

Resistance to Mildew, Aging: Excellent resistance to mildew, aging and abrasion. Prolonged exposure to sunlight causes some degradation.

THANK YOU