cellulose triacetate

low-cost fibre produced from cellulose (wood pulp or cotton linters) which then chemically processed with acetic acid

cellulose acetate

75 – 92 %

cellulose hydroxyl groups
are acetylated

- **modified acetate (secondary)**
- **contains two or more hydroxyl groups**
- **lower ratio of acetate to cellulose**

cellulose triacetate

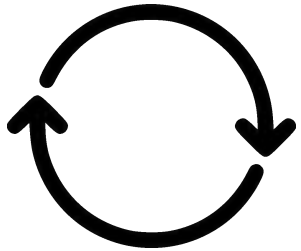
≥92 %

cellulose hydroxyl groups
are acetylated

- **primary acetate**
- **lacks hydroxyl groups**
- **higher ratio of acetate to cellulose**

cellulose acetate

cellulose treated with acetic acid and then with acetic anhydride in the presence of a catalyst such as sulfuric acid

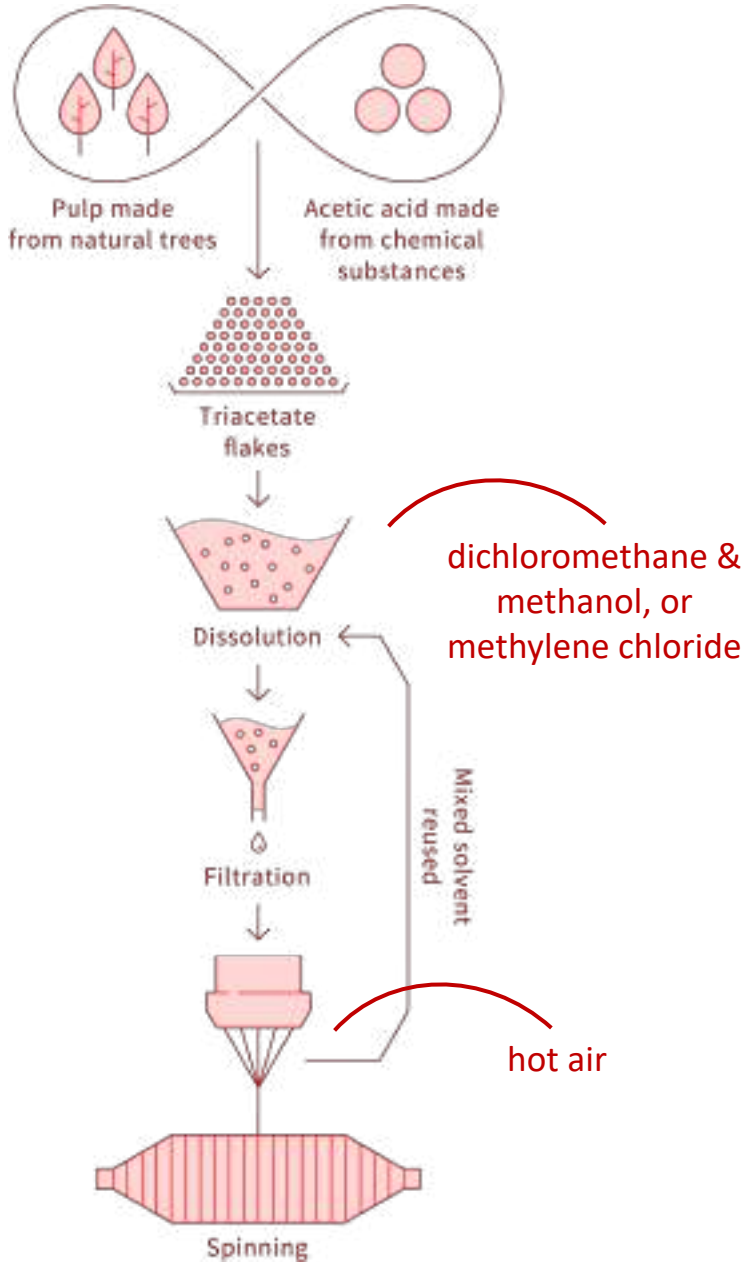


resultant reactions are complete

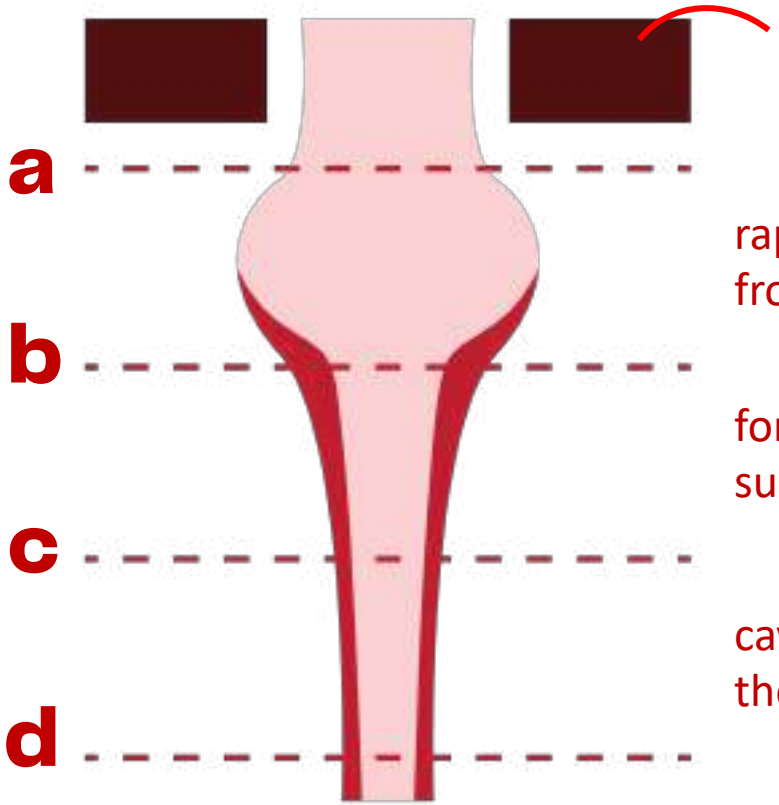
cellulose triacetate

primary cellulose acetate

production



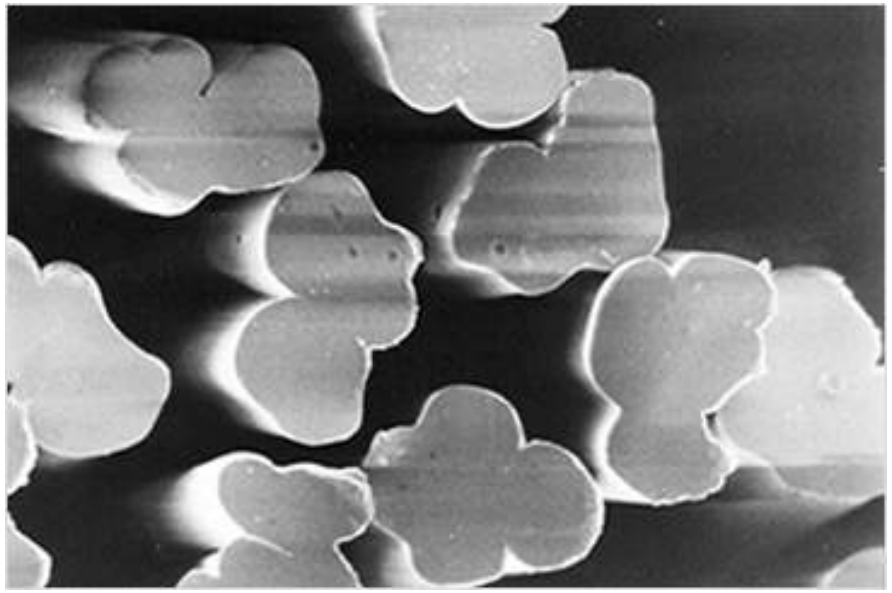
Acetate fibre is produced by reacting high purity wood pulp with acetic anhydride. The triacetate flakes that are produced through this chemical reaction are dissolved in a solvent, filtered, and adjusted to obtain spinning stock solution. The spinning stock solution is extruded through controlled nozzles with extremely small pore diameters ranging from 30 to 50μm. The solvent is then evaporated, and the yarns are formed. This process for producing acetate fibre is known as the dry spinning method. Often, saponification (application of sodium hydroxide) finishing is used to remove acetyl solvents from the surface which minimises statics.

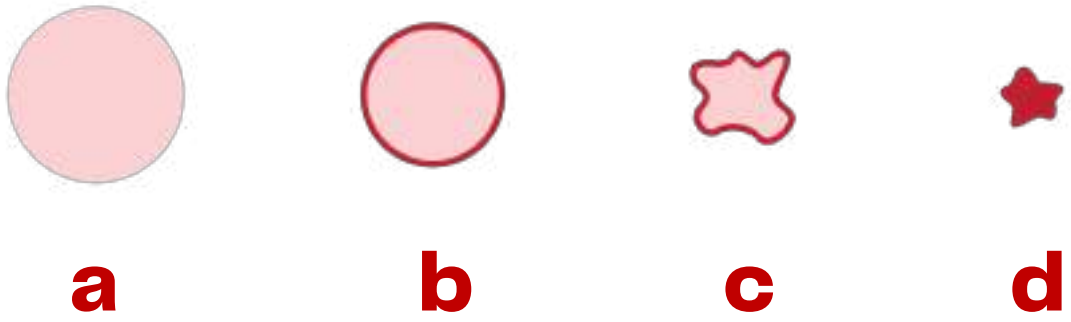


rapid evaporation of solvent from the surface

formation of skin layer on the surface

caving in of the skin layer as the solvent dries up





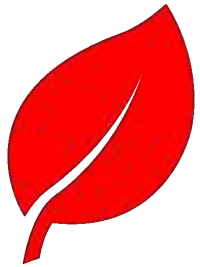
chrysanthemum cross section

characteristics and properties

strong pleating durability

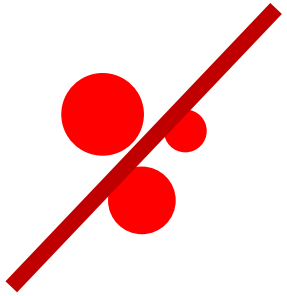
high melting point (300 °C)

does not stain easily

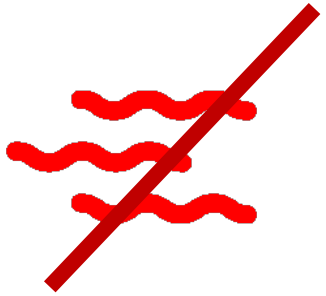


biosynthesis

dyed using disperse dyes



high resistance to pilling

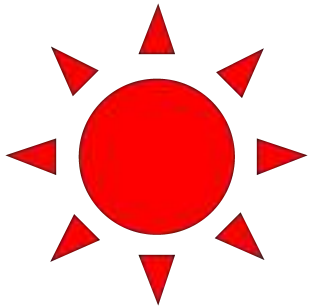


does not shrink easily

cellulose acetate

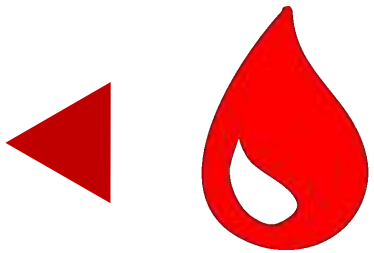
cellulose triacetate

greater resiliency



more heat resistant

more absorbent



fibre blends

cotton blend

to improve wear and performance

wool blend

to counter shrinkage, improve warmth and drip-dry properties

silk blend

polyester blend

often used in 1980s to create shiny tracksuit

linen blend

to reduce production cost