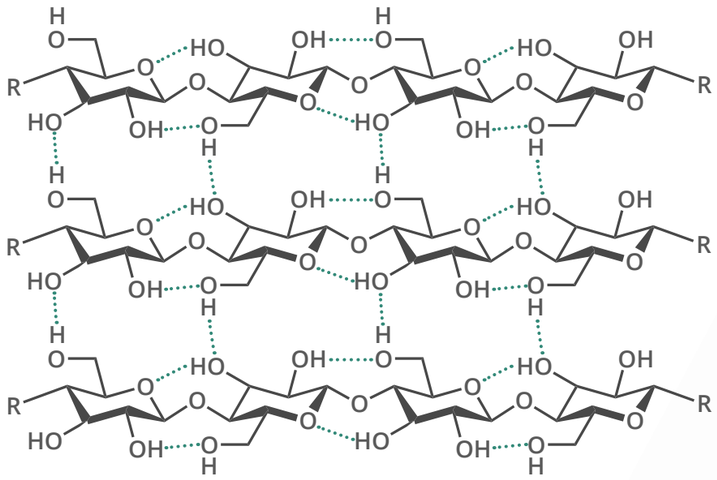
THE CHEMISTRY OF IRONING

What makes your clothes come out of the wash looking all creased? Here's a look at the chemical reasons, and some chemical solutions!

CREASES, CELLULOSE, & IRONING

Plant-based fabrics are predominantly made of the natural polymer cellulose. The cellulose chains in the fabric have a network of hydrogen bonds between them that helps to hold them all together.

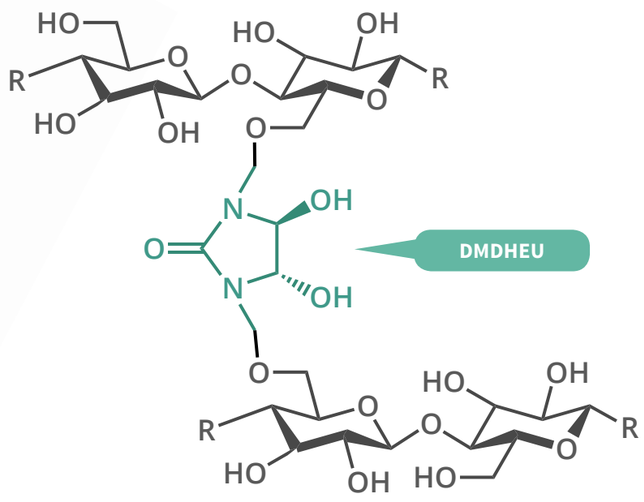


CELLULOSE (DASHED LINES SHOW HYDROGEN BOND NETWORK)

When you wash clothes water breaks up the hydrogen bond network, and cellulose chains slide over each other. When the clothes dry the hydrogen bond network reforms, holding the fabric in its wrinkled state. The heat, moisture, and pressure of an iron breaks up this network and forces the cellulose chains to lie straight, flattening the fabric.

ANTI-CREASE FABRICS

Chemists have come up with ways of producing fabrics that avoid post-wash creasing problems. In the past urea-formaldehyde resins were added to fabrics to form cross-links between polymer chains, holding them in place and preventing creasing.



In many of today's garments, a cross-linker called dimethylol dihydroxyethylene urea (DMDHEU) is used. This forms covalent bonds between cellulose chains that lock them in place, preventing creasing. However, as it can break down over time and release low levels of formaldehyde, chemists are still looking at developing better formaldehyde-free cross-linkers.