Cellulose Encyclopedia Article

Cellulose

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Cellulose

Cellulose is a major structural component of the cell walls of all land plants, including trees, shrubs, and herbaceous plants. The cell wall is a complex **polysaccharide** layer that surrounds each cell within a plant. Chemically, cellulose is a polysaccharide made up of long, unbranched chains of glucose linked end to end, making a very flat chain. (Starch is also made up of glucose, but linked such that it curls, resulting in very different properties.) Many cellulose chains associate side by side to make a cellulose ribbon, or microfibril, that has exceptional mechanical strength and chemical stability. Cellulose microfibrils, which are approximately 5 to 10 **nanometers** thick and many micrometers long, make cell walls strong and able to resist large forces, such as those generated internally by **turgor** pressure or externally by the weight of the plant or by wind. Economically, cellulose is important as a major component of wood products and of fibers used to make paper and textiles, such as cotton and linen. For industry, cellulose is dissolved and spun as a thread (called rayon) or formed into a thin sheet (cellophane). Cellulose is also chemically modified to make many kinds of films (such as cellulose acetate), thickeners used in foods and paints, and coatings such as nail polish (which contains cellulose nitrate).

See Also

Carbohydrates; Cell Walls; Fiber and Fiber Products.

Bibliography

Brett, C. T., and K. Waldron. *Physiology and Biochemistry of Plant Cell Walls*, 2nd ed. London: Chapman and Hall, 1996.