

MISSTEPS ALONG THE HISTORIC PATH OF CELLULOSE CHEMISTRY

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Abstract

A review of the literature on the composition of cellulose raises serious questions about the current paradigm of cellulose. Textbooks and course work have presented cellulose as a homopolymer of β -D-glucose residues. It is interesting to see how this happened. Investigators in the early 1900's were very conscientious about their work and gave much thought to the interpretation of their data. However, the fact remains that we have been unable to find any primary report in the literature which reaches the conclusion that cellulose contains only β -D-glucose residues. However, in some cases, questions remain about the work. In some cases, the starting material and isolation procedure is not described in detail yet the chemistry is described in great detail. In other cases, reviewers used liberal literary license in the interpretation of the work of the early investigators. To say that an early investigator only found glucose in an acid hydrolyzate does not mean that other components were not present. This is especially true if the early investigator did not have the means to detect minor constituents or, as in one case, he recrystallized the glucose twice. One thing is certain that almost all reviewers avoided discussion of the method of isolation and changes in terminology with respect to what was called cellulose. Unfortunately, as better methods of analysis became available investigators did revisit the issue using the new tools probably for the reason that no one thought it was important. Unfortunately, the result is that some product descriptions in chemical catalogs and other documents are misleading. This is only one example of what is probably more common than we realize and simply demonstrates the need for investigators to be cautious when reading reviews and other literature which does not present experimental data.