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## STANDARDS IN BIOMASS

Some researchers have felt a growing need for reference materials for use in biomass conversion studies. This is especially true when a number of different investigators are involved in related fundamental studies and each group uses its own "private reserve" of biomass. Quantitative comparisons are difficult at best, and at worst the possibility exists for contradictory conclusions drawn from differing data bases.

Dr. Tom Milne of the Solar Energy Research Institute decided that someone should take the initiative and as a result became active in exploring the possibilities of establishing biomass standards. Due primarily to his efforts, a workshop was held at the National Bureau of Standards to explore the various aspects of having standards for material as variable as biomass. A limited number of copies of the workshop proceedings are still available from Dr. Milne.

Because of the wide selection available in biomass, the scope of possible standard materials was narrowed to those having the best potential for usage, especially by researchers in fundamental studies. At present the intent is to have at least a cellulose, xylan, and lignin standard, each of which would be fully characterized.

One concern of the National Bureau of Standards is being able to ascertain the demand for standards. The demand, as determined by sales, directly affects price and availability. It would be nice to have intact biomass (not separate components) as reference material. Because of different preferences expressed at the workshop regarding this subject, it was difficult to come to a consensus, especially when demand is the limiting factor regarding establishment of a standard material.

Those interested in agricultural residues might prefer corn stover or sweet sorghum, whereas those interested in woody material would need to choose between hardwood and softwood species. Even among hardwood species, there is no one preference. Aspen is often used because of its ease of delignification and accessibility of its carbohydrate fraction, but it is not a "typical" hardwood, if there is such a biomass material. Those interested in aquatic biomass would desire completely different reference materials. As a consequence, no individual intact biomass standard reference material is being considered presently, but may be considered in the future.

Biomass standards should also be of interest to those involved in wood analyses. They would provide reference materials of known composition that could be used as a control in evaluating analytical methods. This is a case in which an intact biomass standard would probably be of more value than individual components. Analyses of biomass should involve standard reference materials.

Related to this topic is the need to incorporate the more recent analytical developments into standard wood analyses methods. Virtually all standard test methods (TAPPI and ASTM) are modifications of procedures used for many decades. Some of the more common ones still in use, such as Klason lignin and alpha-cellulose, are time-consuming gravimetric procedures. Perhaps with biomass standards, effort will be devoted to the establishment of more modern standard test methods.

If there is an interest in the topics alluded to, especially the need and use of biomass standards, please contact Dr. Tom Milne at the Solar Energy Research Institute, 1617 Cole Blvd., Golden, Colorado 80401.

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