Biomass conversion LP documentation

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Abstract: Linear programming is a technique used to determine the best (or optimal) solution to a problem where there are a number of competing and usually interrelated choices. The technique requires that each restriction on the problem being modeled be formulated as a linear equation. The model consists of a set of linear equations with more unknowns than equations and thus there are many possible solutions. In order to determine the best of these solutions, it is necessary to decide which criteria will be used to determine the best. Once the criteria (usually maximum profit or minimum cost) is chosen, an equation is set up giving the amount each variable (or activity) contributes to the criteria. The linear program then determines which solution will maximize or minimize this criteria. The LP described in this write up was written to determine the best process and set of process conditions for converting steam exploded Aspen wood into a variety of chemical feedstocks. The LP is designed to maximize profit based on the sales value of the chemicals produced, the cost of raw materials and the processing costs incurred. The model is restricted by the raw material availability, the utility and chemical requirements of each process step, the capacity of each process step and the market requirements for each chemical produced. This report will give a detailed description of the model structure, will discuss the validity of the data used in the model as well as future requirements, will discuss the running of the model on the computer and will discuss analysis of the LP solution.

Documentation

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