Production of Cellulase from Trichoderma Reesei Rut-30

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Problem Statement
Design a manufacturing facility to provide cellulytic enzyme (Cellulase) for the biofuel market in the Midwest United States. The production strain will be Trichoderma reesei Rut-30. The facility will produce 20,000 metric tons/year of unrecovered fermentation broth with the production strain inactivated. The recovered product is specified to be 250 g/L active Cellulase with more than 20% glucose added as a stabilizer. 8,000 metric tons/year of product will be produced.

Motivation
The ethanol industry is on the verge of entering a second generation of production materials. There has been a push towards cellulosic carbon sources instead of corn, grain or barley. With this new generation of ethanol production comes the need for new generations of enzymes. The featured type of this new generation is cellulase. Cellulase includes several different specific enzymes, all of which break down cellulosic bio-materials into consumable glucose. Cellulases have become the golden enzyme of this new generation is cellulase. Currently, the two major producers are Novozymes and DuPont. They have a substantial hold on the cellulase market, however, with new production methods and low overhead, there is still a demand to be filled.