

### The optimization of pretreatment by Sulfuric acid solution for *Helianthus tuberosus* residue

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The pretreatment of lignocellulosic is primarily employed to increase the accessible surface area of cellulose to enhance the conversion of cellulose to glucose. The advantage of acid pretreatment is the solubilization of hemicellulose and by this, making the cellulose more easily accessible for the enzymes. The pretreatment of lignocellulosic is primarily employed to increase the accessible surface area of cellulose to enhance the conversion of cellulose to glucose. *Helianthus tuberosus* is easy to cultivate for its strong adaptability to a wide range of soil types and pH levels. Unlike the grain crops, *Helianthus tuberosus* can grow well in non-fertile land and is resistant to plant diseases, not competing with grain crops for arable land. In this study, we had performed pretreatment process by Sulfuric acid solution and researched the optimization of *Helianthus tuberosus* residue pretreatment by the response surface method (RSM). The pretreatment conditions had been determined that the temperature conditions have been at range of 130 ~ 210 °C. We had been confirmed the optimized pretreatment conditions for *Helianthus tuberosus* residue by Sulfuric acid solution.