

## Two-stage pretreatment of cellulosic biomass by Sodium hydroxide and Sulfuric acid

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Cellulosic materials are the most economic and highly renewable natural resources in the world. Cellulosic materials contain sugars polymerized to cellulose and hemicellulose that can be liberated by hydrolysis and subsequently fermented by microorganisms to form different chemicals. Cellulose, hemicellulose, and lignin in plant biomass have been foreseen as useful resources convertible to not only pulp and foodstuff but also energy resources such as alcohol, methane and chemical raw materials such as furfural and organic acids. Pretreatment is an essential element in the bioconversion of cellulosic substrates. The pretreatment of cellulosic is primarily employed to increase the accessible surface area of cellulose to enhance the conversion of cellulose to glucose. It is required for efficient enzymatic hydrolysis of biomass because of the chemical barriers that inhibit the accessibility of enzyme to the cellulose substrate. The pretreatment conditions had been determined that the temperature conditions have been at range of 150 ~ 200 °C. We had been confirmed the pretreatment effects for cellulosic biomass by sodium hydroxide solution and sulfuric acid.