

## CONVERSION OF ISOLATED CELLULOSE FROM SPENT PLANT BIOMASS TO GLUCOSE BY SUB AND SUPERCRITICAL WATER

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Cellulosic biomass is capable to produce various liquid fuels and chemicals. Lignocellulosic biomass is composed of the biopolymers of cellulose, hemicellulose and lignin. Cellulose is a polymer of glucose, which is utilised for the production of biofuel and biochemicals. Presently, India is a global leader for cultivation and production of mentha in the World. The mentha essential oil is obtained by hydro or steam distillation of mentha aerial biomass. After distillation, this mentha biomass is treated as waste and generally used for burning purpose. India alone produces more than 5 million tons of mentha spent biomass per annum. Now, we are targeting this spent mentha biomass for production of high value chemicals and biofuel by green process. We have developed an economical process for isolation of cellulose (~40%), hemicellulose (~25%) and lignin (~15%). The cellulose is further depolymerised to glucose by sub or supercritical water. The reaction is carried out in a 1L supercritical reactor of Autoclave Engineers make. In application of 20% H-Y catalyst in near critical conditions (30 Mpa and 350°C), the yield of glucose is 40-45%. It is observed that H-Y zeolite catalyst is very selective for higher recovery of glucose from cellulose. Further, the study on using titanium vanadium and strontium based catalysts for depolymerisation of cellulose to glucose is in progress.

The cellulose is used for preparation of high value chemicals (hydroxymethyl furfural and levulinic acid), nutraceutical products (fructose, sorbitol and mannitol) and biofuel (ethanol, butanol, dimethyl furan and levulinic ester).

**Keywords:** Lignocellulosic biomass, Mentha spent biomass, cellulose, glucose, supercritical water, zeolite.

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