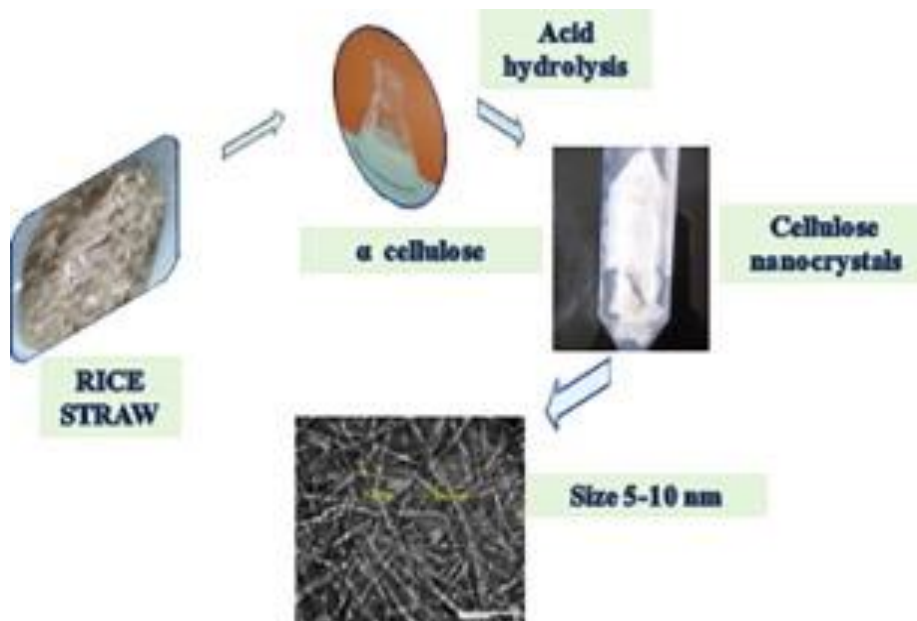


DBT-CIAB scientists produced cellulose nanocrystals from rice straw derived α -cellulose

In recent time, nanocrystalline cellulose has emerged as an important nanomaterial due to its specific characteristics such as bio-renewability and sustainability. Further, it possesses high mechanical strength, optical transparency and many other material properties. A team of researchers led by Dr. S. Goswami at Department of Biotechnology's Center of Innovative and Applied Bioprocessing (CIAB), Mohali, India developed cellulose nanocrystals (CNC) via acid hydrolysis of cellulose derived from rice straw.



The goal of this study was to maximization of the product yield using response surface methodology (RSM) and to further investigate the interaction between three design factors namely, acid concentration, reaction temperature and reaction time to improve the yield of the product. A high CNC yield of 90.28% was obtained at 30 °C temperature, 75 wt% acid concentrations and 5 h reaction time. Morphological characterization was performed by scanning electron microscopy (SEM) which showed the formation of rod shaped CNCs. X-ray diffraction (XRD) and thermogravimetric analysis (TGA) revealed that CNC's have higher crystallinity (76%) than that of α -cellulose derived from rice straw and higher thermal stability respectively. Thus, the isolated CNC will be suitable for use as a reinforcing agent in the fabrication of bio-

nano-composites for various applications. Work was published in *Materials Science for Energy Technologies*

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