

Bioethanol Synthesis Using Cellulose Recovered from Biowaste

Authors : Ghazi Faisal Najmuldeen, Noridah Abdullah, Mimi Sakinah

Abstract : Bioethanol is an alcohol made by fermentation, mostly from carbohydrates, Cellulosic biomass, derived from non-food sources, such as castor shell waste, is also being developed as a feedstock for ethanol production Cellulose extracted from biomass sources is considered the future feedstock for many products due to the availability and eco-friendly nature of cellulose. In this study, castor shell (CS) biowaste resulted from the extraction of Castor oil from castor seeds was evaluated as a potential source of cellulose. The cellulose was extracted after pretreatment process was done on the CS. The pretreatment process began with the removal of other extractives from CS, then an alkaline treatment, bleaching process with hydrogen peroxide, and followed by a mixture of acetic and nitric acids. CS cellulose was analysed by infrared absorption spectroscopy (FTIR), scanning electron microscopy (SEM), X-ray diffraction (XRD), and thermogravimetric analysis (TGA). The result showed that the overall process was adequate to produce cellulose with high purity and crystallinity from CS waste. The cellulose was then hydrolyzed to produce glucose and then fermented to bioethanol.

Keywords : bioethanol, castor shell, cellulose, biowaste

Conference Title : ICECE 2016 : International Conference on Environmental and Chemical Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : April 19-20, 2016