

Cell-free enzyme system for bio-ethanol production

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Over the last few decades, bio-ethanol has emerged the most important alternative energy resource. Cell-free fermentation: a non-cellular approach is among the endeavors in biotechnology today providing a solution for the complexities and limitations linked with conventional fermentation. We developed the cell-free enzyme system through beads beating and insured the presence of enzymes and cofactors through LC-MS/MS Q-TOF and assay kit, respectively. The system was comprised of complete machinery required for the cascade of the biological reactions involved in microbial fermentation. The most important feature of the system was the shifting of ethanol production towards higher temperature ($<40^{\circ}\text{C}$) than conventional fermentation temperature. At elevated temperature (40°C) the system was found more effective (3.83 g/L) than conventional fermentation system (0.48 g/L). This provided an insight for the development of simultaneous saccharification and fermentation process via cell-free enzyme system.