Review

Enzymatic saccharification of lignocellulosic biorefinery: Research focuses

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Enzymatic saccharification of lignocellulosic biorefinery: Research focuses

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Abstract: To realize lignocellulosic biorefinery is of global interest, with enzymatic saccharification presenting an essential stage to convert polymeric sugars to mono-sugars for fermentation use. This mini-review summarizes qualitatively the research focuses discussed the review articles presented in the past 22 months and other relevant papers. The research focuses on pretreatment with improved efficiency, enhanced enzyme production with high yields and high extreme tolerance, feasible combined saccharification and fermentation processes, detailed mechanisms corresponding to the enzymatic saccharification in lignocellulosic biorefinery, and the costs are discussed.

Keywords: lignocellulose; enzymes; saccharification; costs

1. Introduction

Utilization of lignocellulosic biomass to value-added end use is essential to realize circular economy for modern societies (Zhang *et al.*, 2017a; Hu *et al.*, 2016). The lignocellulosic biomass is mainly composed of cellulose, hemicellulose, and lignin (Singh *et al.*, 2017a; Kassaye *et al.*, 2017), with cellulose being a polysaccharide with internal β-1,4-glycosidic bonds, hemicellulose a polysaccharide with randomly branched sugars and uronic acids, and lignin a heteropolymer made of aromatic alcohols (Rodrigues *et al.*, 2016). The cellulose and hemicellulose are formed together