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Abstract: Phosphoric acid plus hydrogen peroxide (PHP) pretreatment was employed on wheat straw for ethanol conversion by simultaneous saccharification and fermentation (SSF) at high loadings. Results showed solid loading of PHP-pretreated wheat straw can be greatly promoted to 20%. Although more enzyme input improved ethanol conversion significantly, it still can be potentially reduced to 10-20 mg protein/g cellulose. Increasing yeast input also promoted ethanol conversion, however, the responses were not significant. Response surface method was employed to optimize SSF conditions with the strategy of maximizing ethanol conversion and concentration and minimizing enzyme and yeast input. Results indicated that ethanol conversion of 88.2% and concentration of 69.9 g/L were obtained after 120 h SSF at solid loading of 15.3%, and CTec2

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