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# Effective saccharification of lignocellulosic barley straw by mechanocatalytical pretreatment using potassium pyrosulfate as a catalyst

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## Abstract

The catalytic conversion of lignocellulosic biomass is attractive due to the feasible generation of valuable products such as reducing sugars which constitute the basic substrates for chemical and transportation fuel production, as well as the production of renewable hydrogen. This study shows the efficient conversion of lignocellulose, especially hemicellulose, into reducing sugars such as xylose and galactose, by mechanocatalysis using potassium pyrosulfate,  $K_2S_2O_7$ , as an effective salt catalyst. Ball milling was performed, introducing a mechanical force which, combined with chemical pretreatment, leads to reducing sugar yields (40 %) almost as high as when commonly used sulfuric acid was employed. Kinetic experiments as well as the optimization of the saccharification process are presented.

*Keywords: Barley straw (Hordeum vulgare), Lignocellulose, Potassium pyrosulfate, Mechanocatalytical conversion, Ball milling*

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