・研究課題名＝「Development of Direct Saccharification of Lignocellulosic Biomass Waste-Rice Straw Using Novel Solid Acidic Catalysts」

・研究代表者名及び所属＝Eika W. Qian, Department of Chemical Engineering, Tokyo University of Agriculture and Technology

・共同研究者名及び所属＝Masaaki Hosomi, Department of Chemical Engineering, Tokyo University of Agriculture and Technology

・要旨（200 語以内）＝The purpose of this study is to develop a novel process to effectively transfer biomass waste - rice straw to valuable monosaccharide. A direct saccharification process of rice straw using solid acidic catalysts that can be recycled and reused has been developed in our laboratory. We investigated the effects of synthesis conditions of a solid acidic catalyst on the BET surface area and microporous structure, acidic properties and catalytic activity in saccharification were investigated. The saccharifications of rice straw and cellulose crystalline were carried out in a batch reactor. The higher aging temperature results in lower BET surface area, acidic amount and hydrolysis activity. In contrast, the longer aging time enhances the hydrolysis activity, BET surface area, and acidic amount. A catalyst obtained via calcinations under nitrogen atmosphere shows the same activity in saccharification of cellulose as that obtained via ethanol reflux to remove the template in synthesis. Further, the recovery and durability of the catalyst were improved by shaping with a binder. Three kinds of rice straw and various parts of a rice straw were used in saccharification; and the hydrolysis features of them were investigated. The monosaccharide yield decreased in the order of stalk, leaf and husk of rice straw. The stalk of rice straw shows the largest monosaccharide yield at 180^{o}C for 1 h was 46.9%. Further, the monosaccharide yield for three kinds of rice straw decreased in the order of leaf star, Takanari, and Koshihikari. The leaf star shows the largest monosaccharide yield at 180^{o}C for 1 h was 33.3%. Moreover, 54.6% of a monosaccharide yield at 150^{o}C for 60 min was obtained in the saccharification of leaf star using Cat. B catalyst, where production yield of monosaccharide was 353g/ kg of race straw.

・キーワード（5 語以内）＝Rice Straw, Saccharification, Solid Acid, Lignocelluloses, Mesoporus Silica