

RESEARCH CATALOGUE

ENERGY
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ORGANOSOLV-BASED FRACTIONATION AND CONVERSION OF BAGASSE TO SUGARS AND PHENOLICS



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Some background information

Part of this research project was supported by PTT Global Chemical PCL. During my Ph.D. studies, I received financial support as part of a student exchange program at Kyoto University during September 2016-September 2017. During that time my research was supervised by Prof. Takashi Sagawa under the project titled "Modification of Visible-Light Photocatalytic Activity for Glucose and lignin Conversion to Value-Added Chemicals". This collaboration was supported by the Thailand Research Fund (TRF) (contract number TRG5780129) and the Japan-ASEAN Science, Technology and Innovation Platform (JASTIP). I am now a postdoctoral researcher at the National Center for Genetic Engineering and Biotechnology (BIOTEC), National Science and Technology Development Agency (NSTDA) under the EECi postdoctoral program.

Main purpose and outcome

My research aimed at investigating the modification of a practical organosolv-based fractionation for efficient separation of sugarcane bagasse. The system was considered in terms of solvent and catalyst reusability. The obtained fractions were then studied with regard to their physio-chemical properties and further utilisation for production of sugars and phenolics. The characteristics of the modified fractionation process was evaluated focusing on its economic feasibility for industrial application. Biorefinery is considered a very potent platform industry for Thailand and an integral part of the biofuel/biochemical industry plan for Thailand 4.0. The establishment of a strong biomass industry should lead to less dependence on imported crude oil and therefore enhanced overall sustainability. This research provided insights into the potential of alternative technologies for conversion of sugars derived from 1st Generation (edible) and 2nd generation (cellulosic) materials and enhanced economic competitiveness of biorefineries.

