

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study investigates five potential weeds naturally grown in Thailand, viz. Mission grass, Guinea grass, Cogon grass, Kans grass, and Giant reed, as biofuel feedstocks. Mission grass, Kans grass, and Giant reed were found to contain high cellulose and hemicellulose contents, and thus chosen to study the optimum conditions for high monomeric sugar production using two-stage microwave/chemical pretreatment. Microwave-assisted NaOH pretreatment released the highest monomeric sugar yields of 6.6, 6.8, 6.8 g/100 g biomass from Mission grass, Kans grass, and Giant reed, respectively, at the optimum conditions. After conducting the two-stage pretreatment (microwave/NaOH pretreatment followed by microwave/H₂SO₄ pretreatment) at the optimum condition, the highest monomeric sugar yields of 34.3, 33.8, 31.9 g/100 g biomass were obtained from Mission grass, Kans grass, and Giant reed, respectively, giving high glucose contents. This two-stage pretreatment is an effective technique to first remove lignin, disrupt lignocellulose structure, and release high monomeric sugar yield, especially glucose contents. Therefore, it can be a choice to be used for bioethanol production.

Recommendations

1. The effect of sample particle size should be studied for the optimum condition in the pretreatment process.
2. Other characterization techniques should be employed to confirm the effect of the two-stage pretreatment, such as wide angle X-Ray diffraction (WAXD) for studying the biomass crystallinity.