





COMPLEMENTARY METHODS FOR THE EVALUATION OF ANAEROBIC BIODEGRADABILITY OF LIGNOCELLULOSIC BIOMASS

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Outline

- Overview
- Selected methods
- Results
- Conclusions



Overview

- Anaerobic digestion of lignocellulosic waste
- Lignocellulosic biomass is remarkably various in many of their properties



 Detailed characterization of biodegradability properties of lignocellulose is required to estimate the anaerobic biodegradability.







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Descriptive approach with PCA and parameters selection



Relationship between BMP₆₀ and ratios of biochemical composition

- The ratio of biochemical composition varied with the composition analyse method.
- Linear relationships exist between BMP₆₀ and the four ratios.
- The trend of agricultural and forest residues was concordant.



- (A) The sum of non-RES fractions to RES
- (B) The sum of non-lignin fractions to lignin
- (C) CELL to RES
- (D) Cellulose to lignin





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Relationship between BMP₆₀ and RES or Lignin content

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- (A) BMP_{60} and RES (%VS)
- (B) BMP₆₀ and Lignin (%VS)

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- BMP₆₀ correlates with the content of RES and lignin negatively.
- The relationship between BMP₆₀ and the lignin content of agricultural residues was better than that between BMP₆₀ and the RES content.



Relationship between BMP_{60} and BOD_{28} or ECD



- Agricultural and forest residues show that two significant linear relationships between BMP₆₀ and BOD₂₈.
- Different types of lignocellulosic residues show different relationship between BMP₆₀ and ECD.
- ECD decreased as the lignin content increased.

- (A) BMP₆₀ and BOD₂₈
- (B) BMP₆₀ and Enzymatic cellulose degradation (ECD) (%Cellulose)
- (C) ECD and Lignin (%VS)



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- The biochemical compositions of lignocellulosic residues obtained from the two methods (Van soest Fractionation and NREL Fractionation) were different.
- BMP correlates relatively well with the ratio of the sum of non-lignin fractions to lignin and that of cellulose to lignin.
- Two significant linear relationships between BMP₆₀ and BOD₂₈ for different types of residues.
- Different types of lignocellulosic residues show different relationships between BMP₆₀ and ECD.



Thank you for your attention!



