

Process optimisation with the help of substrate pre-treatment

Large portions of the biomass that can be used to produce biogas today are limited by slow and poor biodegradability. This prevents their usage as well as limits the efficiency and profitability of many biogas plants. Various pre-treatment techniques (i.e. biological, chemical, thermal and mechanical means) can be applied to remove this

bottleneck by increasing the degradation rate or improving the degradability of biomass. The AMPTS II is an excellent automated fermentation test platform specially designed for fast screening and evaluation of pre-treatment methods for slow and poor biodegradable biomass.

Example 1

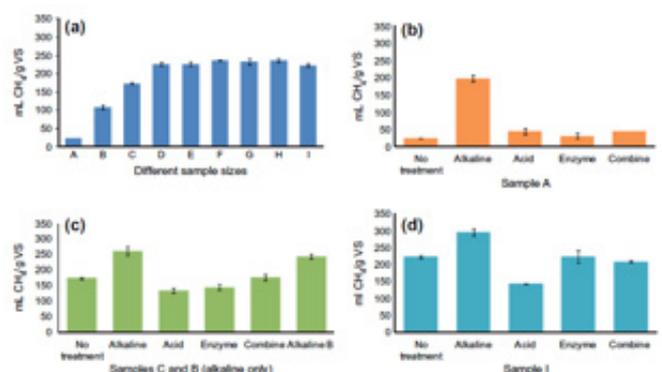
Evaluation of biomass pre-treatment strategies

AMPTS II can be a powerful tool to screen suitable pre-treatment techniques and strategies that give the highest gas production and fastest degradation for any given substrate (Shen et al., 2014; Badshah et al., 2012; Wall et al., 2015; Matsakas et al. 2014).

Example 2

Screening over a range of pre-treatment conditions

An important aspect of any pre-treatment technique is to find the optimal conditions to achieve the best possible results in treatment effect and return of investment. AMPTS II allows the user to easily investigate different settings for a pre-treatment technique of any kind of sample that can be used for biogas production (Antognoni et al., 2013, Schumacher et al., 2014).



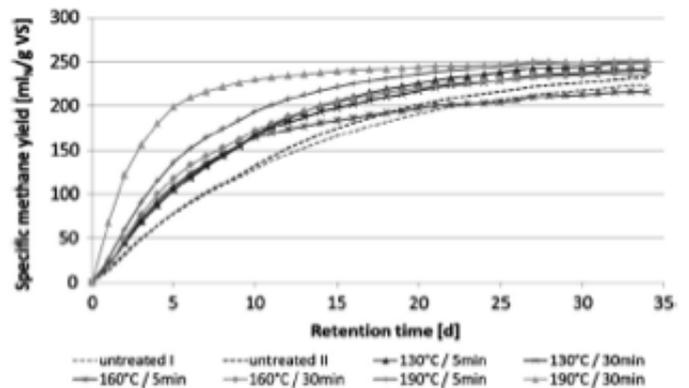
Methane yields of different bamboo fractions after various pre-treatments (Shen et al., 2014).

Example 3

Study of pre-treatment methods for improving the biomass quality

The evaluation of other pre-treatment methods developed to improve the silage quality and AD performance can also be carried out with the help of AMPTS II. For example, microalgae species rich in nitrogen and vitamins, can potentially be used as supplement for silage biomass to improve the nutrient balance and the bacterial community structure (Li et al., 2015).

Another example is the use of AMPTS II to study how the methane yields are influenced by different additive treatments in the silage fermentation process of various herbage samples (McEniry et al., 2014).



Specific methane production of barley straw after steam pre-treatment at different temperatures and durations (Schumacher et al. 2014).

References

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