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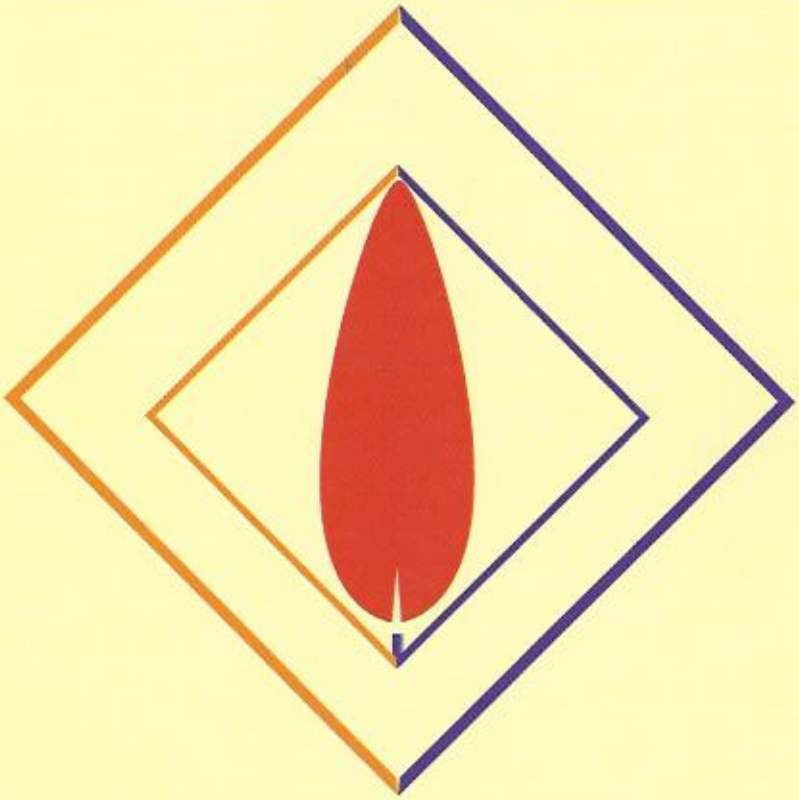

BOOK OF ABSTRACTS

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PHYTOREMEDIATION AS AN EFFECTIVE METHOD TO REMOVE HEAVY METALS FROM CONTAMINATED AREA. PART II. TG/FT-IR ANALYSIS RESULTS OF THE GASIFICATION OF HEAVY METAL CONTAMINATED ENERGY CROPS

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ABSTRACT

Thermal methods such as TG and DTG have been used for studying a variety of areas of engineering. Thermal Analysis determines a set of methods for the study of the selected physical properties of the substance under the influence of temperature or atmosphere. Thermogravimetric (TG) analysis is very useful for studying the kinetics of gasification processes. However, by itself TG does not allow the direct identification of the gases released from the sample during the thermal treatment. For this purpose, coupling TG to a spectroscopic interrogation method, such as Fourier-Transform - Infrared (FT-IR) spectroscopy, is an excellent solution.

The objective of this paper is to ascertain the usefulness and limitations of TG-FTIR technique in the study of biomass gasification and to determine gasification product evolution patterns and yields for heavy metal contaminated (HMC) samples of *Miscanthus* x *giganteus*, *Sida hermaphrodita*, *Spartina pectinata* and *Panicum virgatum*.

In experiments reported in this paper, biomass samples were heated at 10°C min^{-1} in a nitrogen environment and the volatile products were swept immediately into a cooler gas cell, which minimized secondary reactions. Gasification products were quantitatively analyzed by gas-phase Fourier transform infrared (FT-IR) spectroscopy. This gas analysis combined with weight loss measurements of the heated material ensured generally good mass-balance closure. The paper discusses the techniques employed to identify the evolved gasification products and presents the product evolution patterns and yields.

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