

## USE OF SEWAGE SLUDGE FROM THE WASTEWATER TREATMENT PLANT IN TECUCI - GALATI COUNTY AS FUEL

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**Abstract:** *The aim of this paper is an extended study over 12 months, concerning the nature of sludge obtained from a treatment plant and the possibility of its treatment by combustion. The analysis of structural and morphological characteristics of sewage sludge was performed, by SEM and EDAX techniques. Thermal analyses were performed on sludge samples by DSC and bomb calorimeter techniques. Thermal analyzes were performed both on sludge samples with unmodified composition and sludge samples mixed with metallurgical coke in order to determine the optimal concentration of sludge in coke to be sold as fuel. The concentrations of sludge in the coke ranged from 0.5 to 10 percent. Experimental determination of the calorific content was compared with the calculated value. The incineration method of sewage sludge is possible, but only at lower concentration values than 2% wt. At this concentration, some certain deviations already appear in terms of a complete combustion of organic substances under these circumstances. The calorific content was determined using the bomb calorimeter.*

**Keywords:** sludge, coke, incineration, calorific value

### 1. Introduction

Urban agglomerations produce sewage sludge and waste water that are treated in wastewater treatment plant in order to be discharged without harming the environment. ([1],[2],[3]) Waste water treatment technology leads to the separation of a solid phase, so-called sludge.[4] It has two components, organic and inorganic. A major concern is represented by their separation and reintegration in the environment. Worldwide, many ways to remove the municipal sludge were approached. One possibility was represented by their discharge into surface waters or to use the sludge as a fertilizer in agriculture.

With increasing amounts of sludge produced by the new wastewater treatment

plants, the total estimated sludge production at the end of 2020, meaning 415.600 tons of dry substance/year, 50% will be used in agriculture, 20% will be incinerated and the remaining 30% will be co-processed in cement mill.[6] These estimations are hypothetical; the priority is the use of sludge in agriculture.

Another alternative to these methods was represented by incineration or its storage.([9],[10])The new trends in sewage sludge management consist in its combustion, wet oxidation, pyrolysis, gasification and co-combustion of sewage sludge with other materials for its use as an energy source. 9[14],[15])

The aim of this paper is a study on the most economical and efficient way to use this sewage sludge, which means the combustion of the sludge from treatment plant in Tecuci, Galati County.