

Evaluation of combustion system laboratory scale for the energy use of the solid from activated sludge treatment of urban effluents.

C.A. Mendieta-Pino, V. Henriquez-Concepción, A. Ramos-Martín,

J. Waswani-Reboso, F. Romero-Artiles, F.A. Leon.

Department of Process Engineering.

University of Las Palmas de Gran Canaria. Campus de Tafira,

35017 Las Palmas de Gran Canaria – Canary Islands. Spain

emails: carlos.mendieta@ulpgc.es, alejandro.ramos@ulpgc.es

Introduction

The combustion of solid fuel has a different complexity from that of liquid and gaseous fuels. It is of interest to know the possibilities of recovery of numerous urban solid waste and the different configurations that affect the combustion process.

To take advantage of the energy potential of urban solid waste from activated sludge treatment plants a pilot system has been implemented at the laboratory scale, in which to evaluate the main variables that affect combustion.

Keywords: Activated sludge, valorization, solid, combustion.

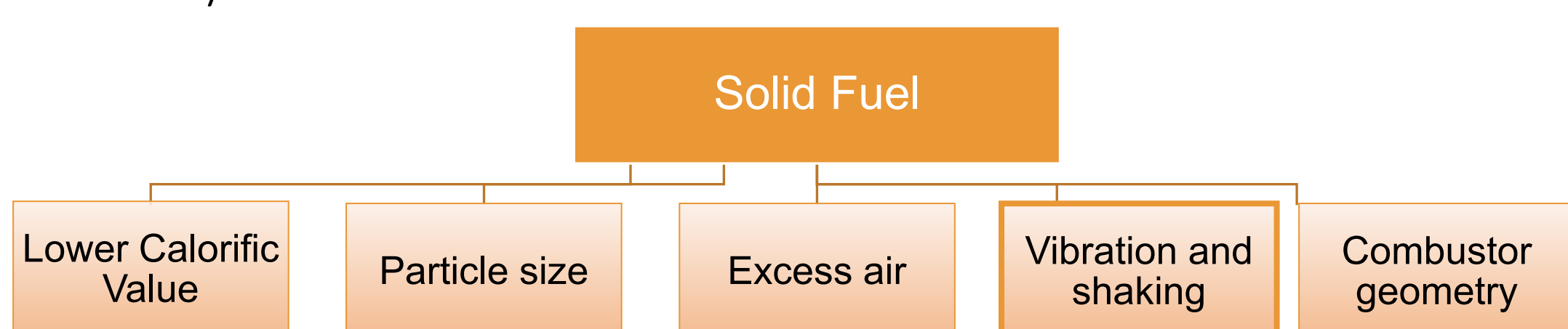
Objective

The objective of this work is to show the experiences and define the main variables that affect the correct combustion for a better evaluation of the solid.

Methodology

- Determination of the terminal velocities for different particle sizes.
- Determination of the density of the sludge.
- Calculation of the heat of combustion of the fuel.
- Mass percentage of Sulphur.

With these tests it was possible to estimate the adequate size that the particles would have to carry out their combustion in the system.



Conclusion

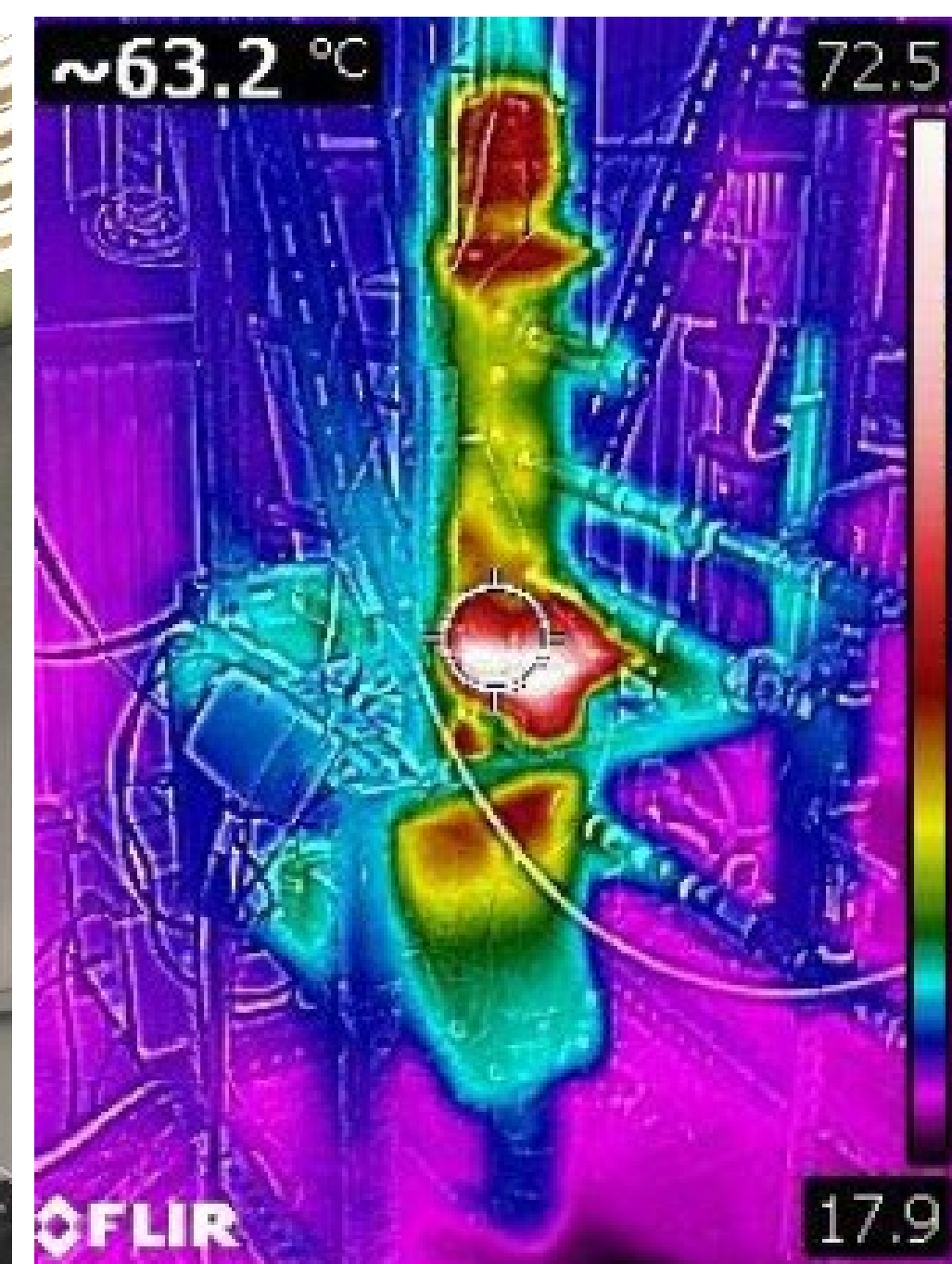
From the results, it was determined that sludge constitutes an acceptable energy resource, but it has a series of specific characteristics that require a burner of specific design.

The implementation of a secondary combustor and the recirculation of gases will help to stabilize the levels of CO and of NO_x SO₂ due to the sulfur present in the sludge, will require post treatment to reduce its resulting slag emissions, its quantity and residual calorific power indicate that the vibrating system used must be separated into two systems: fuel flow control and mixing

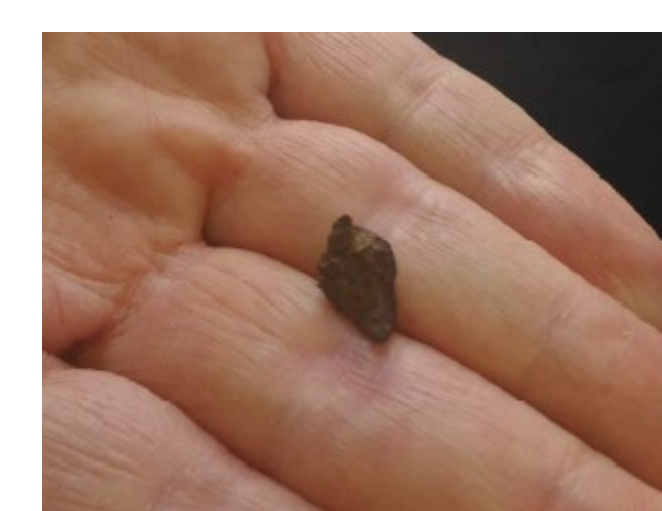
Results



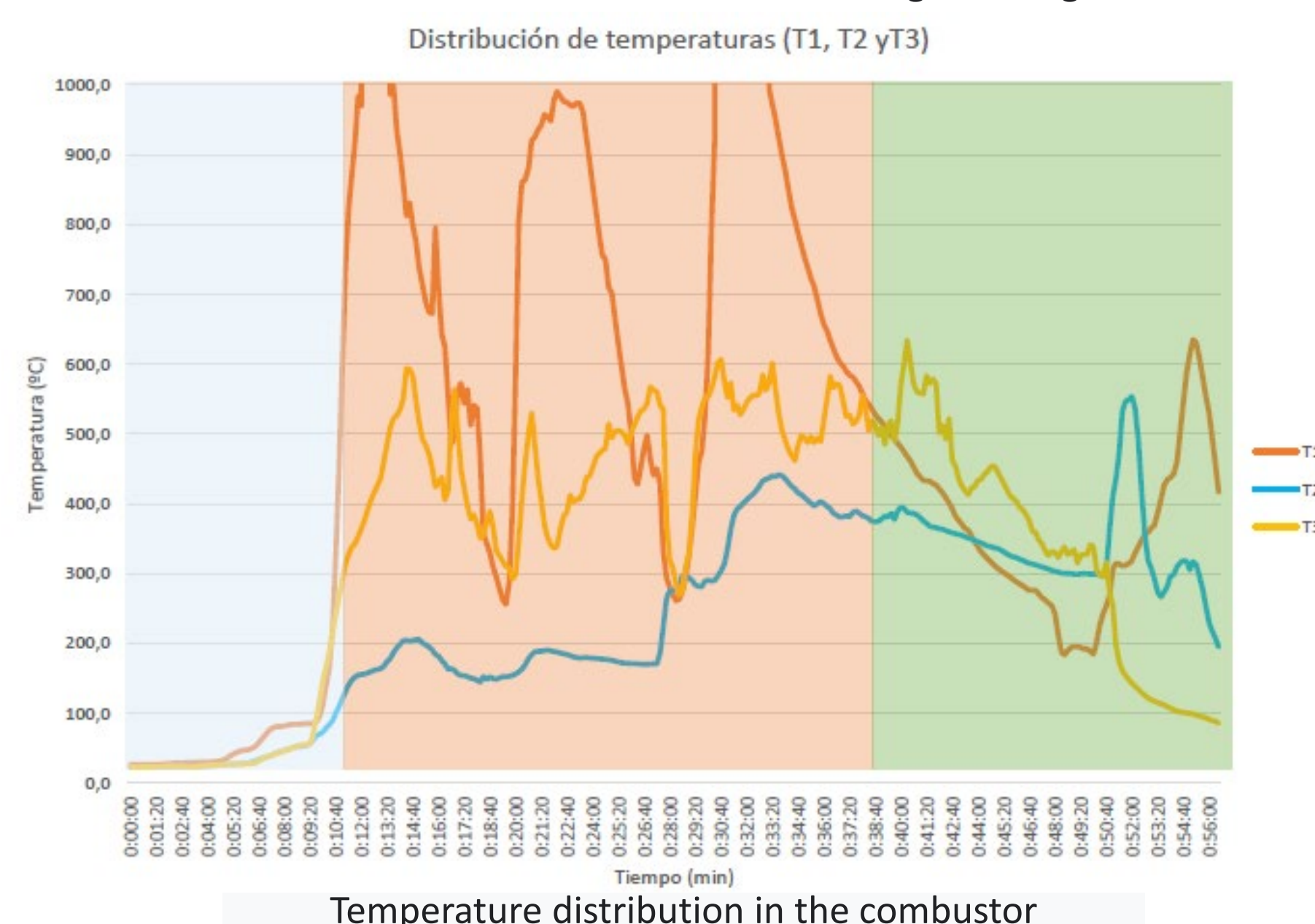
Laboratory scale combustor



Sludge



Piece of slag resulting from combustion



Temperature distribution in the combustor