

CHARACTERIZATION OF GAS EMISSIONS DURING HEATING OF SOLID PRODUCTS

*Nieves Fernández Añez*¹, *Ljiljana Medic Pejic*¹, *Javier García Torrent*^{1,2} and *Álvaro Ramírez Gómez*³

¹*Department of Energy and Fuels, UPM Technical University of Madrid, C/ Alenza 4, 28003, Madrid, Spain*

²*Laboratorio Oficial Madariaga, LOM UPM Technical University of Madrid, C/ Eric Kandel, 1 – (TECNOGETAFE), Parque Científico y Tecnológico de la UPM, 28906 Getafe (Madrid), Spain*

^c*BIPREE Research Group (UPM Technical University of Madrid, Spain)*

nieves.fernandez@upm.es

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1. Introduction

The emission of different harmful gases during the storage of solid fuels is a common phenomenon. The gases emitted during the heating process of those combustibles are the same as those emitted during combustion, mainly CO and CO₂[1]. Nowadays, measurement of these emissions is mandatory. That is why in many industrial facilities different gas detectors are located to measure these gases. But it should be also useful if emissions could be predicted and the temperatures at the beginning of the emission process could be determined.

2. Experimental

Trying to achieve this goal, a new method to measure gas emissions has been developed. This method allows to determine the starting point of the heating process in advance before it is measured by other well-known methods, such as thermogravimetry. Different fuels have been analysed for testing this new method, and also different granulometries and compactations.

3. Results

First of all, a differentiation among fuels has been observed when the gas emissions tests are applied. As shown in Figure 1, each fuel is located in a different region of the CO – CO₂ diagram. Secondly, this differentiation also allows to fit a regression curve and to determine one mathematical equation to predict gas emissions for each kind of fuel and also for each one of the studied granulometries and compactations.

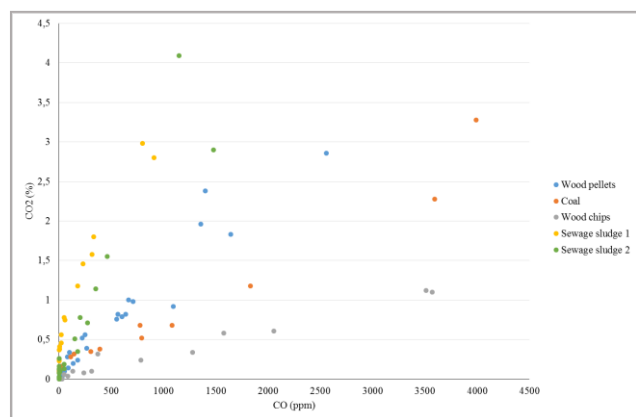


Fig 1. CO – CO₂ diagram of different solid fuels

4. References

[1] N. FERNÁNDEZ ÁÑEZ, A. ÁLVAREZ PÉREZ, J. GARCÍA TORRENT, L. MEDIC PEJIC. Emisiones de CO, CO₂ y SO₂ durante procesos de calentamiento de coque y carbón compactado y no compactado. XII Reunión del Grupo Español del Carbón. Madrid. 2013