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Food industry waste energy recovery by thermal plasma process

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This paper presents the experimental results of food industry waste processing for energy recovery using thermal plasma technology. The thermal plasma is a technology where a gas is superheated and temperatures up of 15,000 ° C can be reached . In this temperature range, the superheated gas does not meet any of the properties of the solid, liquid or gaseous, which causes the plasma is called the "fourth state of matter." The heating of this gas occurs through an electric arc in operation in controlled conditions to achieve greater energy efficiency. Energy is applied to a reactor where, under controlled conditions, gasification of the waste occurs. In these temperatures, there is a molecular disassociation of all gaseous materials, which increases the extractable energy of the gasification process, as compared to other known processes such as incineration, pyrolysis or gasification by other thermal processes. A very important feature and inherent thermal plasma process is the total destruction of the processed material, not generating, after processing, any type of waste requiring a specific disposal. processes. A very important feature and inherent thermal plasma process is the total destruction of the processed material, not generating, after processing, any type of waste requiring a specific disposal. Typically, the process residue with the thermal plasma, we gas production, generation of a metal layer (if any metals in the waste) and generating a vitrified phase material not all gassing. These metal and glazed phases are totally inert and may have specific disposal. The metallic phase may be marketed for the metalworking industry and the vitrified phase can be discarded or used as gravel for paving filling or other uses in the construction area. The energy released by the process gas can be utilized for generating steam, with the use of a combustion chamber and a boiler. Depending on the need of energy matrix where the processing is occurring, it is also possible to use a system with a steam turbine and an electrical generator to provide electrical energy.

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