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Martino Paolucci, Paolo De Filippis, Carlo Borgianni

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PYROLYSIS AND GASIFICATION OF MUNICIPAL AND INDUSTRIAL WASTES BLENDS

ABSTRACT

Gasification could play an important role in the treatment of municipal solid wastes. However, some problems may arise when using unsorted materials due to the difficulties of obtaining a feed with consistent physical characteristics and chemical properties. To overcome this problem, a new type of gasifier consisting of three stages, namely a pyrolytic stage followed by gasification and a reforming stage, was considered. Theoretical calculations made on the proposed gasification scheme shows better performance than a previously studied two-stage gasifier because of its ability of reaching the same final temperature of the syngas with a lower oxygen injection and a better oxygen partition ratio between the stages. The reduced amount of oxygen allows to obtain an improved syngas quality with higher return in the final products, such as hydrogen, electricity and so on.

KEYWORDS

municipal solid wastes, no-hazardous industrial waste, gasification, three-stage gasifier, thermodynamics

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