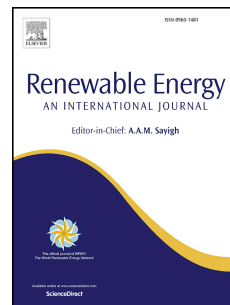


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BATCH PYROLYSIS OF PELLET MADE OF BIOMASS AND CRUDE GLYCEROL: MASS AND ENERGY BALANCES

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ABSTRACT: Glycerol is a side-product of transesterification process, generated during the production of first generation biodiesel. From 10 t of vegetable oil about 10t of biodiesel are obtained together with 1 ton of glycerol as co-product. Glycerol has an interesting energy content and can be used to provide heat and electricity to the same transesterification plant. Pyrolysis of raw glycerol on a rotary kiln reactor can present some difficulties in feeding it with a fluid product, for this reason, the glycerol was previously pelletized with sawdust to produce a solid fuel. Pellets with two concentrations of glycerol were studied: 20%w and 40%w. The results of the experimental campaign performed in the framework of the project TERVEG, partially funded by the Italian Ministry of Agriculture, Food and Forestry, are described in this paper. The results of pelletizing tests showed that the optimal percentage of glycerol is about 20%w, or lower. In fact, this pellet has good durability and good energetic performances, when pyrolysed. Pyrolysis tests performed at 600°C showed that pellet with 40% glycerol has a reduced production of the liquid phase and a higher production of the gaseous phase. Nevertheless, the higher heating value of the gas obtained by pellet with 20%w glycerol and pellet with 40% glycerol is similar and it is about 14 MJ/kg.

KEYWORDS: *pellet, glycerol, pyrolysis*

Symbols

CY	Char Yield [-]
FAME	Fatty Acid Methyl Ester [-]
GL	Glycerol [-]

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