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Higher Calorific Power of Bioethanol Samples Obtained from the Sugar Beet Cultivated in the Experimental Fields of Viisoara - Turda, within the Agricultural Year 2007-2008

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SUMMARY

The paper presents the working method and the results obtained in order to determine the higher calorific power as one of the bioethanol energetic characteristics. The samples of bioethanol came out from the sugar beet experimental field from Viisoara. In obtaining the sugar beet crops, one has taken into account the influence of different technology factors, such as irrigation regime and fertilization.

In order to determine the high calorific power of the bioethanol obtained through sugar beet root fermentation, the following working method was applied, by using the PARR 6200 calorimeter: one weighed 0,6 g as bioethanol sample in the combustion melting pot, which was then placed in its support; a Ni wire was connected to the ends of the two electrodes, making a loop to allow the wire to reach the sample; the calorimetric vessel was filled with water and placed in the calorimeter; the calorimetric bomb was filled with oxygen and then placed in the calorimetric vessel; after making the measurements, the results could be read on the preliminary report typed by the equipment; the final report was obtained after carrying out the necessary corrections (higher calorific power - J/g).

There were carried out 5 trials (their repetitions included), chosen from the samples containing 98,8 % (m/m) content of ethanol and higher saturated alcohols (Table 1).

Tab. 1

Higher calorific power (J/g)

Experimental plot	Repetition 1	Repetition 2	Repetition 3	Average
NF2S2	27 318	27 320	27 316	27 318
NF2S3	27 279	27 273	27 273	27 275
IF2S1	27 534	27 529	27 533	27 532
IF3S1	27 491	27 485	27 491	27 489
IF3S3	27 353	27 357	27 358	27 356

N- non-irrigated; I-irrigated; F*x*-*x* graduation fertilization; S*x* – *x* sugar beet variety.

Higher calorific power had satisfactory values, but, because of the relatively high water content, lower than those determined for various absolute ethyl alcohol samples in the Environmental Analysis Laboratory from ICIA Cluj-Napoca.

Key words: sugar beet, bioethanol, higher calorific power