Energy of Biomass Derived Coumpounds

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**Abstract.**

In this project, it is intended to study the chemical behavior of molecules from biomass, which can be used in the synthesis of new chemicals and biofuels. Thus, it is necessary to know some physicochemical properties of these molecules, such as the combustion energy. These data are very useful in the chemical and biochemical industry, as they help to make better use of the resources coming from biomass for the production of compounds of high commercial value. The sustainable production of new products from biomass, instead of using raw materials from fossil fuels, will help to preserve the environment.

Thinking about this issue, the 12th grade students, in the scope of the Chemistry and Biology subjects, did an internship (one afternoon a week, for 8 weeks) at the Research Center in Chemistry of the University of Porto, CIQ-UP, where they followed the study of the compound 4-methoxy-1-indanone, integrated in a project under development, taking place under the supervision of Ana Luísa R. Silva, researcher at FCUP. The project in question is entitled “Energy and Structural Characterization of Biomass Key Components”, is funded by FCT and has the same investigator as the responsible investigator.

The study of the chemical species, 4-methoxy-1-indanone, was carried out, and will be used as a model molecule to predict the properties of related compounds, reducing the time of search for the molecules alone.

The sublimation technique under reduced pressure was used to purify the sample. The analysis of the degree of purity was performed by gas-liquid chromatography. The static bomb combustion calorimetry technique was used to determine the combustion energy of 4-methoxy-1-indanone.

The combustion energy of a compound is the energy that is released when a mole of fuel undergoes complete combustion within oxygen, under standard conditions.

In this work it was possible to follow a project on the energy study of biomass derivatives and obtain a provisional value for the combustion energy of 4-methoxy-1-indanone, -5046,97 kJ/mol.

Other properties must be determined to better understand this molecule from a chemical point of view. The development of this study, for the universal database, allowed the use of these molecules in the production of new products and fuels, contributing to the reduction of the impact that man has caused in the environment.

**Keywords.** Biofuels, Biomass, Combustion Energy, Physico-chemical Properties

**References**

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