



Application of the LBET class adsorption models to analyze influence of production process conditions on the obtained microporous structure of activated carbons

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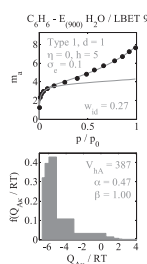
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HIGHLIGHTS

- Analysis of microporous structure of activated carbons obtained from waste biomass.
- Fast multivariant fitting technique applied as the analytical tool.
- Testing how production process conditions affect microporous structure parameters.
- Detailed information can be acquired about the resultant structure using the tool.

GRAPHICAL ABSTRACT



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ABSTRACT

The paper presents the results of the research on the application of the LBET class adsorption models with the fast multivariant identification procedure as a tool for analysing the microporous structure of the active carbons obtained from biomass by physical activation using steam and carbon dioxide as an activator. The proposed procedure of the fast multivariant fitting of the LBET class models to the empirical adsorption data was employed particularly to evaluate the impact of the final temperature of the physical activation on the obtained microporous structure of the carbonaceous adsorbents.

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1. Introduction

Active carbons are amorphous carbonaceous materials characterized by a high degree of porosity and well-developed internal surface. The mentioned materials are highly effective as adsorbents of vapours and gases, hence their usefulness for the industrial processes of adsorption from the gaseous phase, such as the

elimination of dangerous substances from combustion gases [1], the extraction of valuable components from the streams of industrial gases and the separation of gaseous mixtures [2–5]. Active carbons have also been applied in water treatment [6], the storage of gaseous fuels [7], in fuel cells [8]. Moreover, active carbons have also been gaining in popularity as catalysts and catalyst supports [9].

The pore structure of the carbonaceous adsorbents is derived from the structure of the raw material, which is particularly evident in the case of wood-based products. It is therefore important to select appropriate original material in order to obtain the expected porous structure. Due to the high costs of producing active carbons

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