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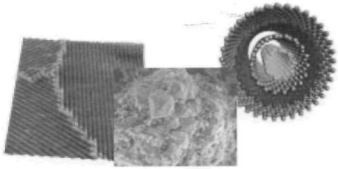

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BOOK OF ABSTRACTS

web-site: http://www.phys.univ.kiev.ua/material/conference

P1.18. SYNTHESIS AND MODIFICATION OF NANOPOROUS CARBON FOR SUPERCAPACITOR ELECTRODES

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To date a number of brands of nanoporous carbon (NC), from which supercapacitors are produced (SC), are famous. But such SC does not always satisfy the requirements of modern electronics and electrical engineering for their parameters. First of all it concerns their specific characteristics (specific energy, specific capacity, internal resistance).

The aim of our research is to enhance specific power-consuming characteristics of SC by applying for their formation cheap carbon materials obtained by hydrothermal treatment method of pits (plum, cherry, apricot).

The aim was solved by use of nanoporous carbon as an active material of SC electrodes obtained by hydrothermal treatment of pits in a closed autoclave, placed in a muffle furnace, where heating of the vegetable raw was conducted in the presence of water vapour to a temperature of 250–300°C. A heating was conducted to complete water evaporation. This raw exposed to further heat treatment without air access to a temperature of 850–900°C. The duration of treatment is 3–4 hours. The next stage is activation of NC obtained by its high-temperature annealing on the air at a temperature of 400–450°C for 70–160 min without the porophore presence. As a results the system pores is formed with the optimal ratio between volumetric fraction ultramicropores (< 0.7 nm), micropores (0.7–2 nm), mesopores (2–20 nm) and macropores (> 20 nm), which is 15:40:20:25.

Electrodes of SC are formed at pressure of 1500–3000 atm of composition mixture

$$<NC>_m:<AB>_n:<Teflon>_k,$$

NC—high-conductive nanoporous carbon with a developed porous structure; AB—conductive addition (acetylene black), Teflon—binder; ($m = 0.8–0,6$; $n = 0.15–0.3$; $k = 0.05–0,1$). As an electrolyte for SC 30% KOH solution +0.3% LiOH in water was used.

This way of NC obtaining enables to form SC with specific capacity of 198 F/g (plum), 176 F/g (cherry), and 185 F/g (apricot).