husk) and harmless sulfur-containing components are used in an insignificant amount. The production technology does not require complex equipment and consists of a one-stage pyrolysis of the feedstock and a sulfur-containing component together at a temperature of 350-400°C and the production of a biochar modified from sulfur by the vegetable raw material. The resulting sulfur-containing carbon materials are selective with respect to such heavy metals as cadmium and copper and can be used to extract and neutralize they toxicity in the water and on the ground environments.

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SELECTION OF OPTIMAL CONDITIONS FOR THE VOLTAMMETRIC DETERMINATION OF ATENOLOL ON “SMART” POLYMERS

Nowadays, polymers are an indispensable component of advanced sensor devices. The polymers which reproducibly respond to changes in the

composition of the environment are called “smart” polymers. “Smart” polymers can adapt to changes in the structure and concentration of many organic (bio-organic) compounds. “Smart” polymers are used to solve the problems of pharmaceutical analysis. Voltammetric sensors are express, inexpensive, highly sensitive, portable devices for controlling the quality of pharmaceutical products.

In this work, sensors based on glassy carbon electrode (GCE), modified by poly(phtalidilidenfluorene) (PPF-Cl) and poly(phtalidilidenbiphenyl) (PPB-Cl), brominated (to different position of cycle) poly(phtalidilidenbiphenyl) (PPB-Br) were developed as “smart” materials for determination of atenolol drugs (ATN). Suitable experimental conditions, such as pH of the background electrolyte, potential sweep rate, accumulation time, and concentration were investigated. The dependences of these parameters on the peak current value were studied.

The effect of pH on the electrochemical oxidation of ATN was studied in the range from 9 to 12 in Britton-Robinson universal buffer solution. The highest anodic current for ATN was observed at pH 11.98 of the Britton-Robinson buffer, so it was chosen as the optimal value. From the dependence of the peak current on the accumulation time of atenolol on the GCE modified by polyphthalidylidene diphenyl bromine (PFD-Br) was found that the current increased during 60 s, reached the maximum value and then practically didn’t change, therefore the accumulation time equal to 60 s was used in further experiments. The effect of the potential sweep rate on peak current value of the ATN oxidation (1.8 mM solution) was investigated in the range from 20 to 200 mV/s, using cyclic voltammetry.

The peak current increased and led to a shift of the potential towards positive values with increasing sweep rate. The anode peak current was directly proportional to the square root of the potential sweep rate, so electrode process of ATN oxidation on the GCE modified by poly(phtalidilidenfluorene) (PPF-Cl) and poly(phtalidilidenbiphenyl) (PPB-Cl), brominated (to different position of cycle) poly(phtalidilidenbiphenyl) (PPB-Br) was controlled by diffusion of electroactive substance to the electrode surface.

Thus, optimal conditions for determination of atenolol on glassy carbon electrode (GCE), modified by “smart” polymers, such as poly(phtalidilidenfluorene) (PPF-Cl) and poly(phtalidilidenbiphenyl) (PPB-Cl), brominated (to different position of cycle) poly(phtalidilidenbiphenyl) (PPB-Br). were established.

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