does not significantly disturbed the inhibitor–metal system and it is possible to follow it over time. The experiments were performed after different immersion times (1-96 h) at the highest concentration of APE (100 mg/L) in 0.5 M NaCl solution. The formation process of protective layer can be classified into two steps, namely fast adsorption (2-18 h) as the first step and then a slow chemical transformation the molecules that were adsorbed on the steel surface (20-48 h). With increase in immersion time, the film becomes denser and more stable. Corrosion protection efficiency increased with extract concentration but decreased slightly over prolonged exposure time. The increase in inhibitor efficiency may result from the fact that adsorption and surface coverage increases with the increase in concentration. As concentration increases, more inhibitor molecules are adsorbed on the metal surface resulting in larger surface coverage.

Potentiodynamic polarization curves indicate that the APE extract acts as a mixed - type inhibitor. Surface analysis techniques (SEM) also confirm the adsorption of the components of the extract on the mild steel surface. From weight loss and electrochemical studies, it has been found that the ACE acted as a good corrosion inhibitor for mild steel in 0.5 M NaCl solution.

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PHENOL ADSOPTION WITH CARBON COMPOSITES

Phenols are one of the most common pollutants entering the surface water with runoff from enterprises. Resetting phenolic water in reservoirs and drains sharply worsens their overall sanitary state and affects living organisms not only with its toxicity, but also with nutrients and dissolved gases (oxygen, carbon dioxide, etc.).

The process of self-cleaning of reservoirs from phenol proceeds relatively slowly and its traces can be carried by the flow of the river over long distances, so the phenol-containing wastewater should be cleaned before dumping.

The purpose of the presented work was the synthesis of carbon composites, effective for adsorption of phenol from aqueous solutions.

To achieve this goal, two composites were synthesized from ZnO and SnO_2 on the basis of the BAU industrial activated carbon using sol-gel technology. Adsorption of phenol from a model solution of a starting concentration of 5 mmol/dm^3 was carried out under static conditions. The concentration of phenol was determined by bromide-bromate method, taking samples after 30, 60, 120 minutes and after 6 hours of adsorption. The weight of the composite adsorbent was 0.5 g in each experiment. The adsorption degree (a, %) was calculated by the formula: $a = ((c_0-c_p)/c_0)\cdot 100$. The results of this study in the form of a graph of the dependence of phenol adsorption degree on time (t, min) are presented in Fig.1.

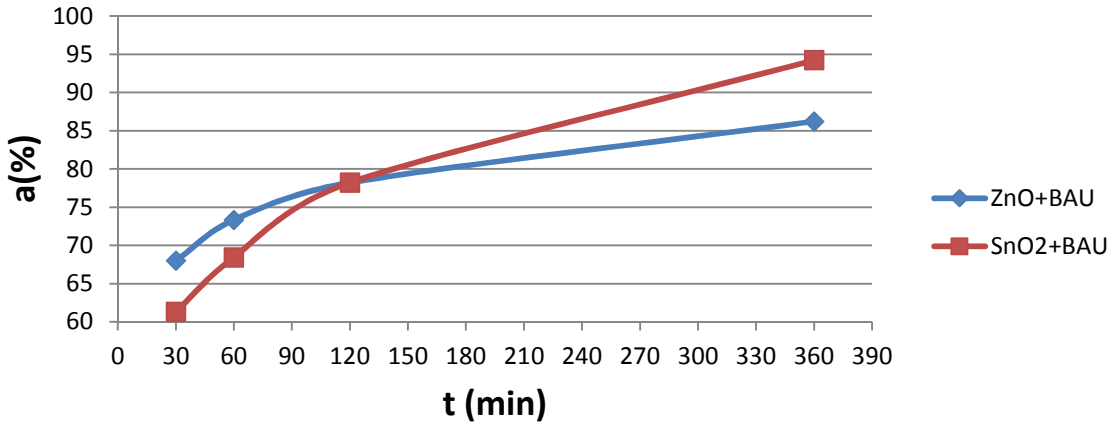

Fig. 1. The adsorption capacity of ZnO and SnO_2 composites on the basis of BAU activated carbon

As can be seen from the figure, at a low contact time of the studied composites with the model solution of phenol, the composite with ZnO showed a better adsorption capacity: 68 % at 30 minutes of contact and 74 % at 60 minutes of contact; for SnO_2 composites these values were 62 % at 30 minutes of contact, and 69 % at 60 minutes.

After 2 hours, the adsorption degree of phenol by both composites became the same and amounted to 79 %. And after 6 hours, the adsorption degree of phenol by the SnO_2 composite was much higher than the ZnO composite. It was 95 % for the SnO_2+BAU composite and 87% for the ZnO+BAU composite.

Thus, the presented experimental data show the high prospects of synthesized and investigated in the present work composites for adsorption processes of phenol removal from solutions.