

Comparison of adsorptive properties of carbon materials depending on method of their synthesis

H.G. Gogotsi¹, N.V. Tyshchenko^{1,2}, A.G. Gogotsi³, L.S. Protsenko¹, I.N. Budilina¹

¹ Frantsevich Institute for Problems of Materials Science of NASU, 3, Krzhyzhanovs'koho Str, Kyiv 03680, Ukraine

² National Technical University of Ukraine "Kyiv Polytechnic Institute", 35, Polytechnichna str, Kyiv 03056, Ukraine

³ Materials Research Centre, 3, Krzhyzhanovs'koho Str, Kyiv 03680, Ukraine

Abstract

In this work we studied adsorption of methylene blue in the range of concentrations 0.047–1.5 mg/ml on adsorbent materials: nanodiamond powders, activated spherical carbon SCS₀₃₀, and three types of activated carbon fibrous material (ACFM). These materials have different morphology of particles and were studied with scanning electron microscopy. SEM-images have shown that ACFM fibers have cylindrical form with some impurities on surface, SCS₀₃₀ looks like highly porous spheres, nanodiamond powder form agglomerates. Analyzing adsorption curves, we compared adsorption properties of these materials taking into account that they were synthesized by different methods and have different porosity and surface area. Based on obtained adsorption isotherms it is possible to make a conclusion about perspective to use activated carbon fibrous material for a broad range of purification operations, adsorption of toxins and as well as bandages during bleeding. SCS

₀₃₀

could be applied for more precise selective blood filtration. Nanodiamonds could be recommended to use as platform for drug-delivery systems.

Keywords: *adsorption, methylene blue, nanodiamond, activated spherical carbon SCS₀₃₀, activated carbon fibrous material*

[Download PDF version of Comparison of adsorptive properties of carbon materials depending on method of their synthesis](#) - in Russian