

REVIEW

of scientific advisor Mansurov Z.A., professor, Doctor of Chemical sciences on thesis of Seitzhanova Makpal Azizovna «Synthesis and application of membrane technology for desalination of seawater», presented for the degree of Doctor of Philosophy (PhD) in the specialty «6D074000 – Nanomaterials and nanotechnology».

The thesis of Seitzhanova M.A. is devoted to the synthesis of graphene membranes from rice husks and their use for desalination of seawater. A doctoral candidate has obtained nanoporous membranes based on graphene obtained from rice husks by carbonization followed activation with potassium hydroxide. The physicochemical properties of graphene membranes and their desalination properties for different salts were studied.

Part of the scientific work of Seitzhanova M.A. was performed during an internship in Naples (Italy), at the laboratories of the University of Naples and at the Institute for Combustion Research.

The results of the dissertation work were published in 16 scientific works, including 1 article in a journal included in the Scopus database, three articles in journals recommended by Committee of the Control in Field of Education and Science, eleven abstracts at international and national conferences and symposiums, and one innovative patent of Kazakhstan for utility model. The main provisions, results, conclusions and conclusion of the dissertation are published in sufficient volume.

The results of the dissertation have theoretical and practical significance. In the scientific plan, the obtained patterns are of interest in modifying natural raw materials, filtering salt ions, studying the physicochemical properties of graphene materials, which make a certain contribution to the development of membrane nanotechnology (sorption, desalination) and nanomaterials.

During the implementation of the dissertation Seitzhanova M.A. mastered the methods of scanning electron microscopy, transmission electron microscopy, elemental analysis, Raman spectroscopy, Fourier transform infrared spectroscopy, thermogravimetric analysis, and also proved to be a responsible experimenter and showed great independence. In general, I positively evaluating the work of Seitzhanova M.A., it should be noted that the work meets all the requirements for PhD doctoral dissertations and can be recommended for defense for the degree of Doctor PhD in the specialty «6D074000 - Nanomaterials and Nanotechnology».

Scientific supervisor,

Doctor of Chemical Sciences, Professor

Z.A. Mansurov

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