

Adsorption of triclosan and its harmful by-products by activated carbon

Aidarova S. B.^{1*}, Issayeva A.¹, Sharipova A. A.¹, Bekturganova N.¹,
Mutaliyeva B.^{2*}, Lygina E.³, Lyubchik S.³, Estrela M.⁴

¹*Kazakh National Research Technical University, Almaty, Kazakhstan*

²*M. Auezov South-Kazakhstan state university, Shymkent, Kazakhstan*

³*Universidade Nova de Lisboa, Lisboa, Portugal*

⁴*Instituto de Soldadura e Qualidade (ISQ); Department of Environment, Lisboa, Portugal*

**mbota@list.ru*

The present work is devoted to the study of adsorption of triclosan, methyl-triclosan and chlorinated derivatives by activated carbon. It was observed, that the sorption efficiency of the carbons adsorbents increases and their sorption capacity decreases with carbon loading. It was shown, that at a given pH for the adsorption in static mode, there is an optimum carbon loading which limits the triclosan uptake/removal.

Thus, for the studied systems, the sorption efficiency of the activated carbon continuously increases until carbon loading of ca. of 2 g/l. A further increase of the carbon loading does not affect the sorption process and triclosan removal remains practically constant. The decrease of the sorption capacity is more pronounced to carbon loading up to 2 g/l. For higher carbon loadings, the decrease on the sorption capacity is less pronounced.

Triclosan is an antimicrobial active component in consumer care products such as toothpaste, mouthwash, and soaps, as well as in household cleaners and even in textiles, such as sportswear, bed clothes, shoes, and carpets. The widespread use of triclosan provides a number of pathways for the chemical to enter the environment, and laboratory tests have shown it to be toxic to aquatic species. The chemical properties of triclosan indicate that it may also bioaccumulate and persist in the environment. Due to the uncertainty in estimating environmental release by this pathway, no predicted environmental concentration (PEC) in surface waters has been derived.