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Effects of environmental parameters of natural waters on the adsorption of organic contaminants by carbon nanomaterials

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The sorption of hydrophobic organic contaminants such as triclocarban (TCC), in aqueous solutions and in natural waters on carbon nanomaterials was studied. In the synthetic aqueous solutions, humic acid (HA) as model natural organic matter, triclocarban (TCC), as a hydrophobic organic contaminant and fullerene C60 (weathered by mimicking environmental conditions) were used. The natural waters were completely characterized before the sorption experiments. The effects of ionic strength, concentration of organic matter and of the pH over the adsorption of TCC on the carbon nanomaterial selected in these experiments, C60 were studied. A model for the adsorption mechanism, as well as an attempt to mimic the real environmental samples with characteristics alike to the optimum ones found in the synthetic samples was developed.

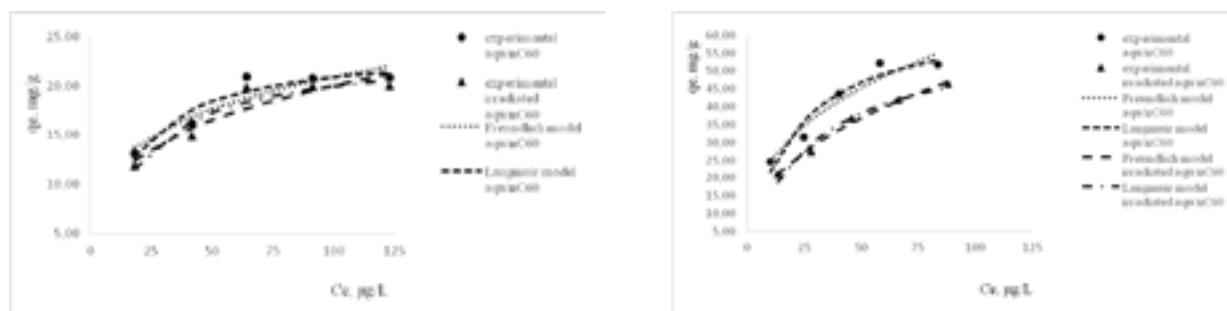


Figure 1: Langmuir and Freundlich non-linear adsorption isotherms of TCC on pristine and irradiated aqu/nC60; Conditions: $C_i=25-125 \mu\text{g/L}$ TCC, $t=5^\circ\text{C}$ (a), 25°C (b), 0.01 M NaCl , 10 mg/L HA , contact time 5 hours, equilibrium reached after 30 minutes.

Recent Publications

1. Zhou L, Zhu D, Zhang S and Pan B (2015) A settling curve modeling method for quantitative description of the dispersion stability of carbon nanotubes in aquatic environments. *J. Environ. Sciences.* 29:1-10.
2. Yang Q, Li X, Chen G, Zhang J and Xing B (2016) Effect of humic acid on the sulfamethazine adsorption by functionalized multi-walled carbon nanotubes in aqueous solution. *RSC Advanced.* 6(18):15184-15191.
3. Huffer T, Kah M, Hofman T and Schmidt T C (2013) How redox conditions and irradiation affect sorption of PAHs by dispersed fullerene. *Environ. Sci. Technology.* 47(13):6935-6942.
4. Hou L et al. (2017) Complex interplay between formation routes and natural organic matter modification controls capabilities of C60 nanoparticles (nC60) to accumulate organic contaminants. *J. Environ. Sciences.* 51:315-323.

Biography

Alina Catrinel Ion has her expertise in studying the environmental applications of certain types of carbon based nanomaterials. Her scientific interests include determination of organic pollutants in atmospheric environment; characterization and measurements of nanostructures and carbon nanostructures and their food and environmental applications

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