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Master Thesis Abstract

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Investigation on the influence of filter materials on the removal of micropollutants from wastewater

Micropollutants- trace compounds which enter the water-soil-air matrix through anthropogenic activities have been found to create potential hazard to the aquatic ecosystem. These compounds are found in pharmaceutical, chemical engineering and personal care product industries. When they are released into the environment, micropollutants undergo distribution between different phases, biological and abiotic degradation. Removal of micropollutants depends on the physico-chemical properties of these compounds and the environment where the micropollutant is present (such as groundwater, surface water, sediment, wastewater treatment systems, drinking water facilities). Activated carbon is frequently used worldwide in the post-treatment of municipal wastewater to reduce the micropollutant load. In this study, granulated activated carbon (GAC) is used as a filter material to reduce micropollutant load from the effluent from secondary treatment process in ISWA wastewater treatment plant and performance of 13 micropollutants was evaluated. Adsorption studies of the micropollutants with different dosages of granulated activated carbon (GAC) is performed. Solute (micropollutants) parameters were studied (expressed as $\log D$, K_{oc} , K_d) with changing carbon dosages and adsorption isotherms were plotted. Dissolved Organic Carbon (DOC), Spectral Absorption Coefficient (SAC) at a wavelength of 254 nm was also conducted. Removal efficiency of micropollutant load with GAC and DOC reduction was studied. Adsorption onto Granulated Activated Carbon has been found as an effective method to remove Micropollutant load in wastewater treatment.

Keywords: Micropollutants, Municipal Wastewater, Adsorption, Granulated Activated Carbon (GAC), Adsorption, Adsorption Kinetics, Adsorption Isotherms