

ABSTRACT OF THESIS

MICROPLASTIC IDENTIFICATION-REMOVAL AND STUDYING ABOUT ITS BACK WASHING EFFICIENCY

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Microplastics have been detected in several environments, such as in the air, terrestrial, surface water, river lake, or deep ocean. Wastewater treatment plants (WWTPs) are mentioned to be the main pathway of microplastics into the natural waterways. Besides, the rapid sand filter (RSF) is one of the conventional water purifiers that can be an alternative treatment for removing MPPs after several configuration processes (pre-sedimentation, coagulation-flocculation, and sedimentation).

In order this study aims to determine the effectiveness of RSF in removing microplastic particles with 100-300 μm effective size grain filter media. The artificial samples were made from water bottle shredding particles combined in distilled water medium and wastewater collected from the domestic laundry process. The average removal efficiency of MPs was $4.3\pm 2.6\%$, $13.1\pm 7.2\%$, and $2.6\pm 1.4\%$ in case "A", "B", and "C", respectively. In contrast, the efficiency of back wash in each case was $79.7\pm 8.7\%$, $91.1\pm 1.1\%$, and $90.1\pm 4.9\%$ in Cases "A", "B", and "C", respectively. The detected MPs in this experiment are majority fibre and flake shapes with tiny sizes around 30-50 μm .

The result observation obviously shows that the size of MPs essentially affects removal effectiveness on wastewater treatment by using a rapid sand filter.