# Development of Real-time Detection System of Microplastic in Tap Water

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## Abstract

Recently, the detection and removal of micro-plastics in the purification plant has received large attention due to the detection of foreign materials from tap water in Korea. Most detection systems for micro-plastics are conducting through sampling process. A system that detects micro-plastics in the flowing water in real-time without sampling has not been developed so far. Therefore, the goal of the present study was to establish a real-time detection system to determine the presence and the location information of micro-plastics in tap water. The real-time detection and measurement experiments were performed on polystyrene (PS) and high-density polyethylene (HDPE) with different characteristics such as size, shape, and density. Experiments were conducted at relatively low flow velocity (3 - 5 cm/s) similar to the condition in water purification plant. As a result, the possibility of real-time detection of micro-plastics with D = 44, which was intended to be carried out in this study, was sufficiently verified. After acquiring the image, it was possible to improve the accuracy by analyzing the images of micro-plastics based on deep learning algorithm and suggested a way to cope with the detection of micro-plastics in the water purification plant.

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**Biography**

Jeong Jae Kim is an Assistant Professor in the department of Mechanical Engineering at Hanbat National University. His research interests are fluid mechanics, and environmental pollutions including micro-plastics and particulate matters. He is currently conducting a research to develop a detection technology for air and water pollutants by applying the flow visualization technique.

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