

OCCURRENCE OF MICROPLASTICS IN WATER AND WASTEWATER

ABSTRACT

Microplastics (MP) are currently a growing concern on environment as well as on human health. Microplastics can be observed in air, aquatic and terrestrial environment also in water treatment facilities. Due to usage of daily products such as cosmetics, packaging, etc. and industrial processes, microplastics end up in treatment facilities afterwards in soil and water bodies. MPs are very resistant to degradation it can stay more than 15 years in environment. Because of the resistance to degradation, MPs end up with run-off in water bodies that used for drinking water or tap water. However, human health risks of MPs are not studied extensively.

The purpose of this study is to have an understanding of MPs, identification and analysis as well as the removal performances in treatment facilities and different alternative technologies. According to this purpose we investigated the kinds of MPs mostly detected in water samples, identification and analysis methods for MPs, best method to analyse the water and sludge samples, removal percentages in WWTPs, removal percentages in a drinking WTP with the implemented coagulation and ultrafiltration technologies and also effects on sludge and digester gas production.

As a result of our research based on different literatures, there is no standart method for the identification and analysis of microplastics also there are also lack of studies on human health. Furthermore, according to density of the MPs in WWTPs the highest removal rates are observed in primary and secondary treatment units such as grit and grease and primary sedimentation units, etc. In addition, in tertiary treatment processes does not remove significant amount of MPs. Alternative technologies such as MBR and RO performs highest removal efficiency. In drinking water treatment plants, coagulation followed by ultrafiltration shows very high removal rates. Lastly, MPs in sludge can reduce biogas production.

Although there are several studies made until now, there is still lack of information about MPs, effects on health and treatment facilities. The goal of this review is that draw attention to subject of MPs and help people have an understanding of MPs.