Pulsed Plasma Gas Discharge (PPGD) A Novel Innovation for Decontaminating Municipal Wastewater

Mike Broderick, Athlone Institute of Technology, Ireland

Abstract. The aim of this study is to investigate the development and optimization of a high-intensity, pulsed plasma, gas-discharge (PPGD) system for the novel decontamination of wastewater that may contain hazardous chemicals. The presences of these chemical compounds in treated effluent shows that conventional wastewater treatments do not fully remove or destroy these threats to the aquatic environment and in turn public health. As the PPGD system produces multiple short-lived decontaminating properties in the treatment chamber, which includes ozone, acoustic shock waves, UV light and pulsed electric fields, it may facilitate the novel removal or destruction of unwanted chemicals in wastewater treatment. In order to investigate the efficacy of the PPGD system the destruction of phenol and diclofenac in spiked water samples and the effects of the treatment on the toxicity of the sample post treatment was examined.