

Environmental Study on Urban Disinfection Using an On-site Generation System

Authors : Víctor Martínez del Rey, Kourosh Nasr Esfahani, Amir Masoud Samani Majd

Abstract : In this experimental study, the behaviors of Mixed Oxidant solution components (MOS) and sodium hypochlorite (HYPO) as the most commonly applied surface disinfectant were compared through the effectiveness of chlorine disinfection as a function of the contact time and residual chlorine. In this regard, the variation of pH, free available chlorine (FAC) concentration, and electric conductivity (EC) of disinfection solutions in different concentrations were monitored over 48 h contact time. In parallel, the plant stress activated by chlorine-based disinfectants was assessed by comparing MOS and HYPO. The elements of pH and EC in the plant-soil and their environmental impacts, spread by disinfection solutions were analyzed through several concentrations of FAC including 500 mg/L, 1000 mg/L, and 5000 mg/L in irrigated water. All the experiments were carried out at the service station of Sant Cugat, Spain. The outcomes indicated lower pH and higher durability of MOS than HYPO at the same concentration of FAC which resulted in promising stability of FAC within MOS. Furthermore, the pH and EC value of plant-soil irrigated by NaOCl solution were higher than that of MOS solution at the same FAC concentration. On-site generation of MOS as a safe chlorination option might be considered an imaginary future of smart cities.

Keywords : disinfection, free available chlorine, on-site generation, sodium hypochlorite

Conference Title : ICSCSS 2021 : International Conference on Smart Cities and Sustainable Systems

Conference Location : Berlin, Germany

Conference Dates : May 20-21, 2021