Research on the UV disinfection of treated wastewater		
Whole term	1994. 1~1994.3	

(Purpose)

According to the standards for discharging the treated wastewater, E. coli should be lower than 3,000/mL. It is recommended in the ‘Standards for Wastewater Treatment Systems’ to use the chlorine disinfection to satisfy the standard, and many treatment plants use chlorination to treat E.coli. Even though, the treated wastewater can be reused as recycled water and water for landscapes, there are many problems associated with the chlorine disinfection: free residual chlorine and combined residual chlorine such as chloramines adversely affect aquatic organisms; compounds of organic chlorine such as THM generate, and viruses or parasites are more survivable against chlorine than E.coli which may bring sanitary risks. Therefore, UV light, ozone, chlorine dioxide and chloramines are considered as alternative disinfectants.

This study focused on a method to maintain the process of disinfection by means of the UV disinfection, in order to avoid the problems related to the chlorine disinfection. Then, the stability of the effluent was investigated according to the chemical used for disinfection and the acquired data were organized. In 1993, the process of disinfection in the wastewater treatment plants, the stability indicator and the disinfection by-products were investigated and a plan for an actual plant-test was arranged.

(Results)

1) Chlorination, UV and ozone disinfections were compared.
2) A list of criteria for each of the categories such as; sanitary safety, water-living environment, mutagenicity and disinfection by-products, was selected in order to examine the UV disinfecting-equipment. The selected criteria were as follows:

(1) General list: temperature, pH, electrical conductivity, turbidity, COD_{Mn}, BOD_5, nitrogen, phosphorus, residual chlorine concentration and UV transmissivity
(2) Sanitary safety : coliform group, fecal coliform, enterococcus species, coliform phage
(3) Water living environment : laver (Susabinori)
(4) Mutagenicity : *Bacillus subtilis Rec-Assay*
(5) Maintenance of the UV disinfecting-equipment: The following facts were recorded in case of daily checks and regular period checks. Pressure, current, consumed electrical energy, UV monitoring system, cleaning the pipe that preserves the lamp, exchanging the lamp element, and number of people and the time required to clean these things.

3) After the organization of actual conditions and unsolved problems, an indicator for estimating disinfection methods and a plan for an actual plant test were established in 1994. The details are included in this report.

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