

Estimation of N_2O emission factors for sewage treatment plants

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Sewage treatment plants (STPs) are considered to be one of the key emission sources of nitrous oxide (N_2O). It is estimated that 3,000 ton- N_2O were emitted from STPs during 2005. This study investigated the major characteristics of N_2O emissions from STPs using the A_2O series method. The examined STPs of this study were A_2O series treatment plants such as conventional A_2O , Media- A_2O , and 5-stage treatment plants. The N_2O concentrations from STPs were measured using GC-ECD.

A comparison between N_2O emissions and hydraulic retention time (HRT) was performed, with HRT appearing to have an effect on N_2O emissions because the reduction of HRT increased the inflow nitrogen load. Also, a relation between N_2O emissions and the C/N ratio was developed, with N_2O emissions affected by the influent C/N ratio. The result suggests N_2O emissions discharged from STPs increased with decreasing the C/N ratio of influent sewage. Average emission levels of N_2O from STPs using the A_2O series method ranged between 14.01 and 52.96 kg N_2O /day. The N_2O emission factors for the anaerobic/anoxic/aerobic variable method, Media- A_2O and 5-stage method were 128.55, 110.13, and 150.87 mg/m³, respectively.