Decompose trace toxic impurities with hydrogen peroxide and ozone.

HiPOx™: Advanced Oxidation Water Treatment

Features

- Performs powerful oxidation compared to treatment with ozone alone.
  ➡Powerfully decomposes organic substances in wastewater.
- Mixers are placed immediately after the stage of ozone gas injection port, thus blending wastewater with ozone gas effectively.
  ➡Reduction in quantity of ozone gas injection compared with treatment with ozone alone, thus resulting in a lower running cost.
- Adopts multi-point ozone injection, thus suppressing the generation of reaction byproducts (when used for drinking water).

Overview (Technical principles, actions, etc.)

Teijin's multi-stage ozone treatment system using hydrogen peroxide (HiPOx™) efficiently oxidize and remove organic substances in wastewater by pressurizing and adding ozone gas into wastewater after the wastewater is added with hydrogen peroxide and generating OH radicals that has greater level of oxidation than ozone.
Furthermore, the multi-stage ozone injection and the mixer placed immediately after the addition of pressurized ozone accelerate the efficiency of decomposition reaction in the system.
HiPOx™ consists of a reaction block, ozone generator, liquid oxygen tank, control panel, gas separator to process residual ozone gas, and ozone destruction equipment. The operation of the system is fully automated. This compact system ensures ease of installation and it can be incorporated into other equipment. Moreover, the system can be used in combination with other wastewater processing technologies.
The system decomposes and remove odor compound, taste, and odor substances, 1,4-dioxane, chlorinated solvents, phenol, chemical herbicides, and endocrine disrupting chemicals into CO_2 and H_2O.
HiPOx™ Process has acceptance to meet disinfection criteria for unrestricted water reuse under Title 22 of the California Code of Regulations.
※"HiPOx" is a trademark of Aptwater, Inc, USA.

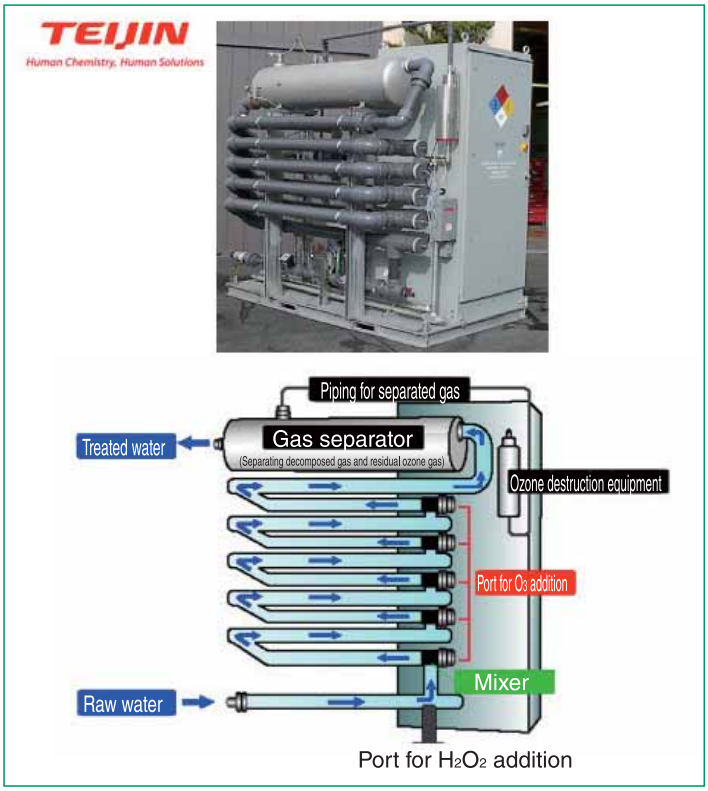
It forms hydroxyl radicals through the addition of ozone gas and hydrogen peroxide to decompose and remove organic matter.

$$2O_3+H_2O_2 \rightarrow 2\cdot OH+3O_2$$

$$\text{Substances to be treated} \xrightarrow{\cdot OH} \text{Intermediate} \xrightarrow{\cdot OH} CO_2+H_2O$$

(Residual ozone gas is separated from treated water using gas separator. The ozone gas thus separated is decomposed and made harmless by ozone destruction equipment before being discharged.)

Principle of Treatment



Overview of HiPOx Technology

Introductory Track Record

■ Over 60 units have been sold in the USA (A large number of records of accomplishment on the removal of 1,4-dioxane from underground water.)

Effects

①Strong Oxidizability Compared with Treatment with Ozone Alone
The system added with hydrogen peroxide and ozone generates OH radicals that have greater level of oxidation than ozone, thus performing oxidation reaction efficiently and powerfully decomposing the organic matter in wastewater.

②Saves Energy and Running Cost
The multi-stage ozone injection and the mixer placed immediately after the addition of pressurized ozone provides high reaction efficiency.
The system reduces the consumption of ozone, footprint, and performs energy-saving wastewater treatment.

③Suppresses Generation of Reaction Byproducts
By controlling and optimizing the consumption of ozone, the system can suppress the generation of bromate, causal substance of trihalomethane.

【Example of 1,4-dioxane Disposal with HiPOx™】

	Disposal rate	Concentration in wastewater	Concentration in treated water
Company A	200t/d	150ppb	<3ppb
Company B	1,000t/d	65,000ppb	<10,000ppb
Company C	3,000t/d	5ppb	<3ppb

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