

## 应用范围

### APPLICATION

- ③ 高浓度生化废水预处理，改善废水生化性。  
Pretreatment of high-concentration biochemical wastewater to improve the biochemical properties of wastewater.
- ③ 蒸发脱盐前处理，提高蒸发结晶效率，减少蒸发母液量。  
Treatment before evaporation, improve the efficiency of evaporative crystallization, and reduce the amount of evaporative mother liquor.
- ③ 降解难生化有机物，生化残留，深度氧化，实现提标改造或近零排放。  
Degradation of biochemical organic matter to improve biochemical properties, and realize upgrading and reconstruction or near-zero discharge.



### 运行数据 Operation Data

预处理氧化系统				稀释5倍生化实验		
原水COD (mg/L)	出水COD (mg/L)	氧化去除率 (%)	B/C	生化进水COD (mg/L)	生化出水COD (mg/L)	生化去除率 (%)
20600	8238	60.01%	0.21	1698	386	77.25%
18910	7074	62.59%	0.19	1463	363	75.18%
18692	7012	62.49%	0.22	1462	359	75.44%
18692	8196	56.15%	0.23	1693	404	76.14%
18692	8758	53.15%	0.21	1797	405	77.46%
16900	8688	48.59%	0.25	1778	394	77.84%
17910	7400	58.68%	0.19	1542	379	75.39%
17910	6290	64.88%	0.21	1358	305	77.56%
17910	6802	62.02%	0.22	1430	322	77.51%

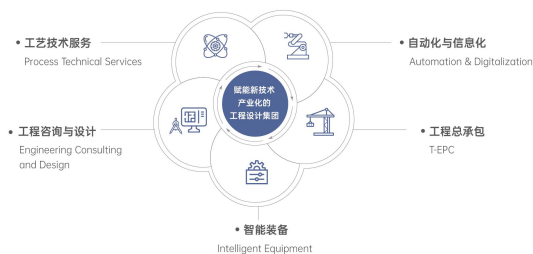
催化回用试验				不同酸度工况氧化试验效果			
回用次数	原水COD (mg/L)	出水COD (mg/L)	COD去除率	pH	原水COD (mg/L)	出水COD (mg/L)	COD去除率
初始	23400	8880	62.05%	2.0	20908	8500	59.35%
一次	21380	7975	62.70%	3.0	18821	7450	60.42%
二次	19678	7300	62.90%	4.0	18832	8275	56.06%
三次	18854	7750	58.90%	5.0	19341	7600	60.71%
四次	18112	6170	65.93%	6.0	18880	7900	58.16%
五次	18268	7300	60.04%	7.0	19236	7657	60.19%

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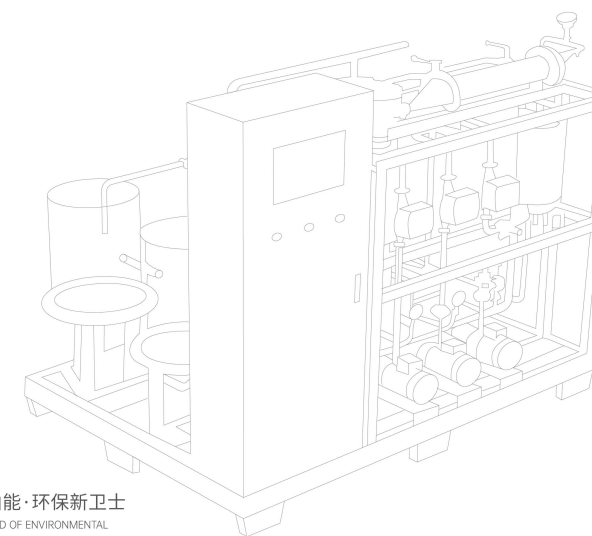


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TIANS 天俱时

## Photocatalytic Oxidation Wastewater Treatment Equipment

### 光催化氧化污水处理设备



### 跨越自由能·环保新卫士

A NEW METHOD OF ENVIRONMENTAL PROTECTION BY REMOVAL OF FREE RADICALS

## 设备介绍

### EQUIPMENT INTRODUCTION

光催化氧化污水处理设备是基于羟基自由基( $\cdot\text{OH}$ )化学活性高,能促进有毒、有害、难生化有机物氧化分解的特殊化学性质,消除废水毒性,提高废水生化性,同时部分矿化有机物,降低污染浓度,达到污染物无害化处理的废水处理设备。

The Photocatalytic Oxidation Wastewater Treatment Equipment is wastewater treatment equipment based on highly chemically active hydroxyl radical ( $\cdot\text{OH}$ ) that can promote the oxidative decomposition of toxic, harmful and bio-refractory organic compounds, eliminate the toxicity of wastewater, improve the biochemical properties of wastewater, and also partially mineralize organic matter, and reduce contamination concentration, thereby rendering pollutants harmless.



## 技术原理

### TECHNICAL PRINCIPLE

污水中的污染物RH分子在紫外光照射后转化为激发态游离基 $\text{R}^*$ ;双氧水在催化剂作用和适当波长紫外光照射下光解为羟基自由基。体系中羟基自由基与激发态 $\text{R}^*$ 大量产生,两者快速进行氧化反应,同时羟基自由基同样氧化污染物RH。

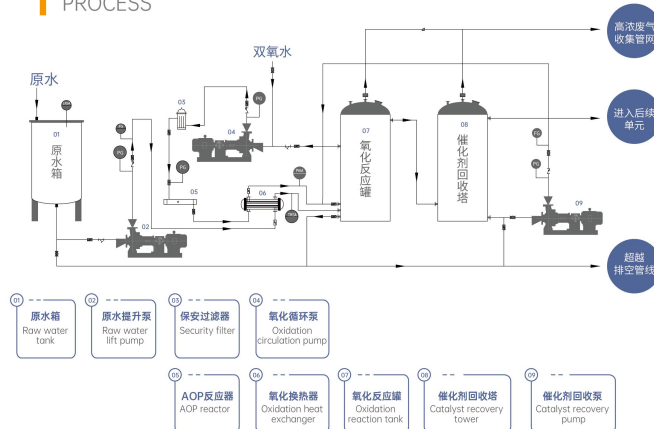
多个不同的氧化反应将废水中的有机物开环、断裂、转变为小分子有机物、羧酸,并最终将有机污染物转化为 $\text{CO}_2$ 和 $\text{H}_2\text{O}$ 。同时在反应过程中含有 $-\text{OH}$ 、 $-\text{COOH}$ 等官能团的中间产物显著增加,从而消除生物毒性,显著提高废水的可生化性。

The pollutant RH molecules in sewage are converted into excited free radicals  $\text{R}^*$  after being irradiated and charged by ultraviolet light. Hydrogen peroxide is photolyzed into hydroxyl radicals under the action of catalyst and irradiation with ultraviolet light of appropriate wavelength. In the system, an abundance of hydroxyl radicals and excited state  $\text{R}^*$  are generated, and the two undergo a rapid oxidation reaction, while the hydroxyl radicals also oxidize the pollutant RH.

A number of different oxidation reactions convert the organic matter into small organic molecules and carboxylic acids through ring-opening and chain scission, and finally convert the organic pollutants into  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . At the same time, a number of intermediate products containing functional groups such as  $-\text{OH}$  and  $-\text{COOH}$  increases significantly during the reaction, thereby eliminate biotoxicity and significantly improves the biodegradability of wastewater.

## 工艺流程

### PROCESS



## 设备优势

### EQUIPMENT STRENGTHS



#### 60%以上COD去除率,生化性显著提高

The COD removal rate is more than 60%, and the biochemical properties are significantly enhanced

紫外线和催化剂双重催化,反应效率高,COD去除率稳定于60%以上。大分子破坏率90%以上,生物毒性消失,生化去除率90%以上。

The dual catalysis of ultraviolet light and catalyst has high reaction efficiency and the COD removal rate remains stable above 60%. Large molecule destruction rate of over 90% biotoxicity disappears, and the biochemical removal rate is more than 90%.



#### 二次污染少

Less secondary pollution

催化剂可回用,除氧化过程中产生微量悬浮物,无催化剂引起二次污染。装置体积小、密封性好,废气产生量小。

The catalyst can be reused, and only a trace amount of suspended matter is generated in the process of oxidation. Catalysts will not cause secondary pollution. The device features a compact size, good sealing, and little exhaust gas.



#### 药剂使用效率高、耗量少

Little consumption of agents as a result of highly efficient use

催化剂可回用,消耗量极低,在紫外和催化剂的双重作用下,氧化剂利用率高,有效减少氧化剂的使用量。

The catalyst is reusable, requiring little consumption. Under the dual action of ultraviolet light and catalyst, the high rate of oxidant utilization effectively reduces the amount of oxidant used.



#### 全自动运行、操作维护简便

Fully automatic operation, ease of operation and maintenance

模块化组装,一键启动,全自动运行。运行过程不需人工操作,仅进行取样检测、远程监控、例行巡视。

Modular assembly, one-key start, fully automatic operation. There is no need for manual operation in the operation process, only sampling and testing, remote monitoring, and routine inspection are required.



#### 占地小、维护保养方便

Small footprint and ease of maintenance

主体设备模块化设计,立体组装,占地小;维护工作仅为紫外灯管的定期清洗,工作量小。

The main equipment has a modular design and three-dimensional assembly for a small footprint; The maintenance only needs regular cleaning of the UV lamps with a small workload.

