

RED^x generator

The RED^x Advantages



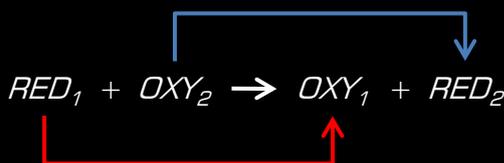
RED-OXY[®] system prototype

Watch-Water[®] Germany is the only innovator to introduce the first On-Site RED^x generator and the Strongest Oxidant Solution [SOS] generator for disinfection and adsorption of almost every contaminants in water. RED^x technology combines salt of RED^x, OXY^x and ADSORB^x to generate the most cost effective high capacity Oxidant, Disinfectant and Adsorbent with Real Chemistry on site. Our Xtremely intelligent and expertly designed RED^x generators give all our customers the freedom to produce oxidants, disinfectants and adsorbents in the amount they need and when they need it. RED^x will serve any kind of water in any kind of industries. RED^x generators are available in different sizes to fit every applications and to produce much superior results compared to any other oxidants and disinfectants including adsorbents, available all over the water treatment market. RED^x chemistries will clean over 7000 billion gallons of water everyday. Safer, economical and absolutely more effective RED^x is just a new revolution in the process of making water neat, clean and safe and without any hazardous byproducts.

Explanation I

RED is to reduce
Extrremely Toxic organics and
Disinfection of water
 with
Oxidation potential of over 8.5 V
Xtremely high sulfate and hydroxyl radicals
Yielding breakthrough in chemistry and process

Explanation II



RED₁ and RED₂ are both Reducers
 OXY₁ and OXY₂ are both Oxidizers

Each pairs $\begin{matrix} RED_1 / OXY_1 \\ RED_2 / OXY_2 \end{matrix}$ are corresponding pairs

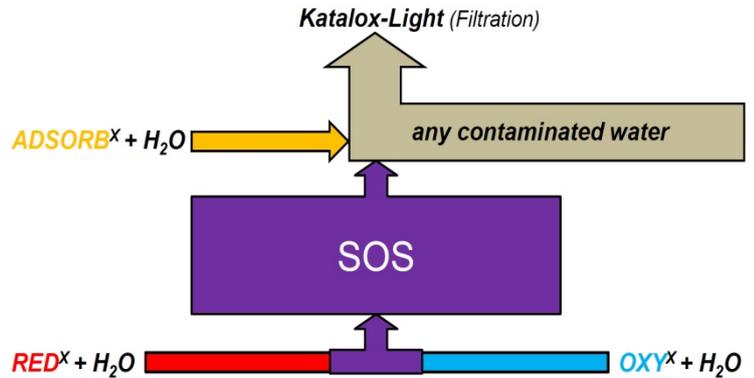
Oxidizers give electron (-) and Reduce
 Reducers takes electron (+) and Oxidize
 This process is called **REDOXY Reaction**

Strong Oxidation Solution (SOS)

SOS

Strong Oxidation Solution (SOS) is the highest performing oxidant and disinfectant without producing any environmentally toxic byproducts. The revolution starts and its efficiency is derived from the second oxidant present in the **ADSORB^X** solution in the form of hydrogen peroxide which adjusts the COD and BOD to zero after dosing.

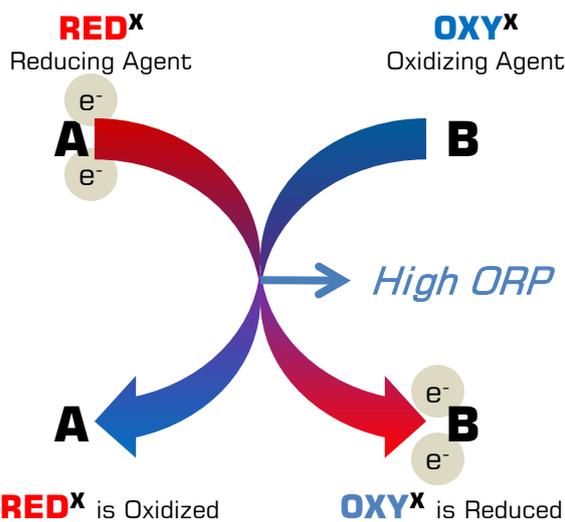
1. **RED^X** and **OXY^X** both food grade salts are injected into the pipe.
2. Strong reaction occurs inside the pipe producing Strong Oxidant Solution (SOS)
3. SOS is ready to use



The days of Ozone, Chlorine, Chlorine gas and Toxic Biocides are gone...

Thanks to RED-OXY!

Oxidation & Reduction



Oxidation
Is
Loss of electrons

Reduction
Is
Gain of electrons

Future of Water and Wastewater

Imagine wastewater so clean that you could bottle it. Imagine an oxidant so strong yet safe. Imagine a disinfectant so powerful but without any byproducts (DBPs). Imagine 1000 liters of wastewater with just few grams of solid waste. Imagine a water treatment facility so safe that you never have to worry about dangers associated with manufacturing Ozone gas or transporting, storing and using Acids and chlorates to produce chlorine gas. All technologies using salts and water and manufacturing HOCl are useless, just useless!

RED-OXY Mobile Lab Kit has proved to water and wastewater companies around the world that **RED-OXY** on-site test offers significant advantages to prove that this is the only technology which proves its efficiency on site and no other technology can prove it.

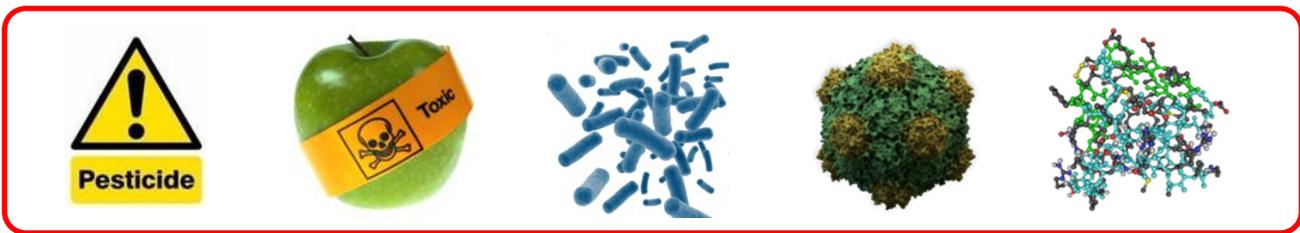
It's safe with RED^X - OXY^X - ADSORB^X. Only Katalox-Light for filtration and Catalytic Carbon polishing for better taste and odor and to catch microorganisms to make the best water by Watch-Water[®].

To Protect Our Environment



**What is
 RED-OXY?**

Watch-Water[®] has given a special attention to Advanced Oxidation Technologies (AOTs) where extremely strong and transitional radical species such as **Hydroxyl Radicals (HRs)** and **Sulfate Radicals (SRs)** are generated to attack organic and inorganic contaminants.



What is RED^x?

The element of **RED^x** is iron which is one of the metals in periodic table that is named as "Transition Metal". This is the secret of **RED^x** that it exhibit multiple oxidation states. In fact, theoretically the valence up to +8 can be generated. But the most stable valence is +6 which is called Ferrate (FeO_4^{2-}). Ferrate is a very powerful oxidizing compound that can be utilized in many applications. Ferrate has Oxidation Potential of 2.2 Volts under acidic conditions. As one of the most practical and powerful transition metal Ferrate [*Fe(VI)*] can be utilized to create **Fenton's Reaction** (activation of H_2O_2 with **RED^x**) with its modification to **Hydroxyl Radicals (HRs)** with an extra oxidation potential of 1.8 – 2.7 Volts (depends on the pH and dosing of **OXY^x** values). Since **RED^x** has now been changed to a catalyst all sulfates in composition of **OXY^x** generates **Sulfate Radicals (SRs)** with a redox potential of 2.5 – 3.1 Volts. Heterogeneous generation of Sulfate Radicals has now changed dissolved **RED^x** ions into the solid phase. Metallic hydroxide ($FeOOH$) particles (as

adsorbent) can be easily removed by **Katalox-Light Filtration**.

The reaction mechanisms of **RED^x + OXY^x + ADSORB^x** which makes REDOXY based Advanced Oxidation Technology unique.

The highest oxidation reduction potential 2.2 (Ferrate) + 2.7 (HRs) + 3.1 (SRs) = 8.0 for the followings,

- Removal of Toxic Cations – [See List Part I](#)
- Removal of Toxic Anions – [See List Part I](#)
- Oxidation of inorganic - [See List Part I](#)
- Oxidation of Organic Contaminants - [See List Part I](#)
- Destroy Pharmaceuticals and Personal Care products
- Destroys endocrine disrupting chemicals
- Removal of pesticides fungicides and herbicides
- Destroys all bacterial and viruses
- Destroys Petroleum Hydrocarbons

- Please refer to [Part I : General Description](#) for the detailed lists of contaminants.

RED particles can clean pollutants

Adsorption "A Trap"

RED particles made from **ADSORB^X** have a hydrophobic core and a hydrophilic shell. Then Watch-water came up with the idea to use these particles to remove toxic chemicals and pollutants including hormones from water and soil using UV light. Due to molecular scale forces, in a solution hydrophobic pollutant molecules are attracted more towards the hydrophobic **RED particles** and **ADSORB^X** on to their surface, where they effectively become "trapped". Without using **ADSORB^X** these would remain dissolved and dispersed evenly in water. But when come in contact with **ADSORB^X** which stabilizes the outer shell of the particles as a shed - and now "enriched" by pollutants – they form larger aggregate that can be removed through Katalox-Light filtration.

This unique invention of Watch-Water[®] can be used to extract

- Phthalates
- Hormone-Disrupting chemicals used for softening plastics
- **BPA** – another endocrine disrupting synthetic compound widely used in plastics and plastic bottles and hundreds of different consumer goods from thermal printing paper samples
- Polycyclic hydrocarbons
- Carcinogenic compounds formed from incomplete combustion of fuels
 - from contaminated soil.

Even more exciting!

The oxidation, Disinfection, Adsorption and Filtration, this whole process is irreversible and the backwash waste is biodegradable – minimizing the risks of toxic secondary products to persist in say "**A Body of Soil**".

Once they switch to this Macro-situation where there are big clumps "Nobody can bring them back".

For the pilot applications where you do not need an expensive system, just use **RED-OXY Lab Kit** to purify water, wastewater or concentrate. It is a cheap testing kit which every water treatment company can afford.

We bring you the possibilities!



*RED-OXY Technology : probably
the ultimate invention
in Water-Treatment*

To stay up-to-date with the latest information, literatures, case studies on **RED-OXY Treatment** please click the Green Apple!



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