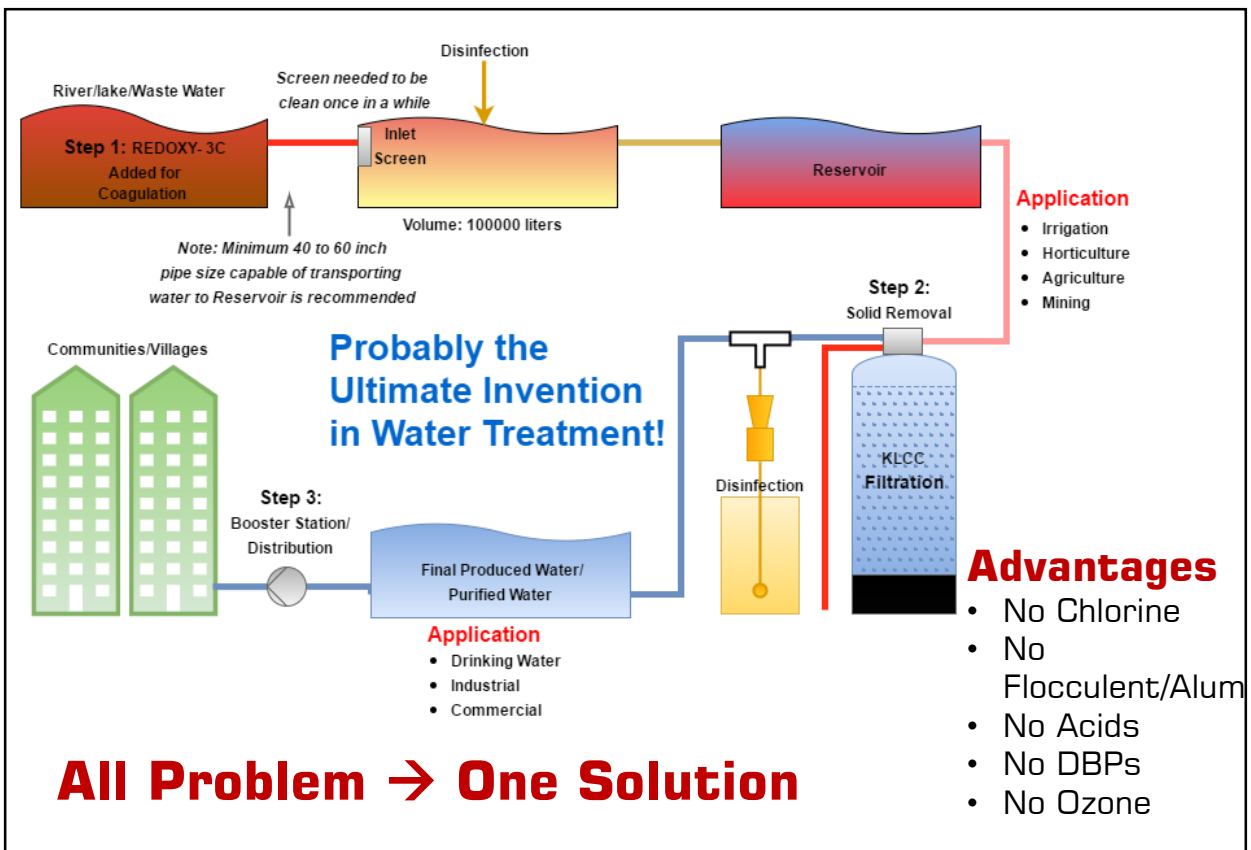


REDOXY - 3C

Combined Treatment Technologies

Surface Water/Waste Water Treatment Plant Watch Water Solution



INTRODUCTION TO REDOXY-3C

Introduction

Combined Fenton-like-Oxidation and Iron ferrates for chemical oxidation of contaminants avoiding Dosing Pumps by spreading evenly (hand) to achieve better results.

Watch-Water now provides special **REDOXY** Combine treatment of Surface water and Ground water remediation. In combined remediation technologies such as mixing, diluting and Dosing using Pumps and to treat, and induction of **Oxidative** or Reductive conditions are very cost effective and time consuming. However, these applications are dependent on circumstances, and therefore **REDOXY-3C** has proved to be cost prohibitive and very effective at contaminated sites without injection/ and mixing.

Surface, Groundwater and waste water contamination poses a long-term risk to the environment and the value of your land. Watch Water can help you clean up test, safe and effective-without even buying any equipment or system. Our **REDOXY-3C** the most environmental friendly product resolves the environmental issues of polluted lakes, Rivers and all industrial sites where hydrocarbons, metals, heavy metals or Organics have leached into the water.

For in depth information on **REDOXY** treatment, please find the **REDOXY** brochure on **Watch Water** website.

NO MORE LIABILITY

Only One treatment is enough. Your Visual monitoring will show a reduction in contaminants within a matter of day, Within a few day's they are completely eliminated-removal your liability and giving you the best starting point for negotiating a future sales and feeling great without any legal claim's.

As a member of the **Watch-Water Group**, we are dedicated to sharing knowledge and procedures for successful use of **REDOXY-3C** granules for water and waste water problems. We are the only Manufacture of **REDOXY** in whole world.

For more than 30 years, leading Water and waste water companies rely on **Watch-Water** for a true expertise and proven Filtration and Adsorption process. Among many products, our Instant Dosing Powders can be used for Scale, Corrosion and Biofouling from pipes and water related problems. **I-SOFT-DW** is to protect your piping system from scale and corrosion. We work closely to gather with our sister companies in all continents ensuring the right management team and understanding of local customer needs.

Our Products for lakes, ponds, rivers and water reuse are most advanced and up-to-date technologies available.

- Adsorption of Nutrients
- REDOXY-3C
- OXYSORB
- Aerobic & Anaerobic bacteria



REDOXY-3C
TREATMENT

REDOXY Chemistry

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 (FeO₄²⁻).

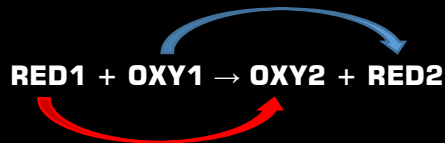
Ferrate is a very powerful oxidizing compound that can be utilized in many applications. Ferrate has Oxidation Potential of 2.2 Volts under acidic conditions. As one of the most practical and powerful transition metal Ferrate [**Fe(VI)**] can be utilized to create **Fenton's Reaction** (activation of H₂O₂ 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 **KATALOXLIGHT[®] Filtration**.

Explanation I

RED is to reduce
Extremely 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

RED1 / OXY2
OXY1 / RED2

are corresponding pairs.

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

Oxidation and Reduction

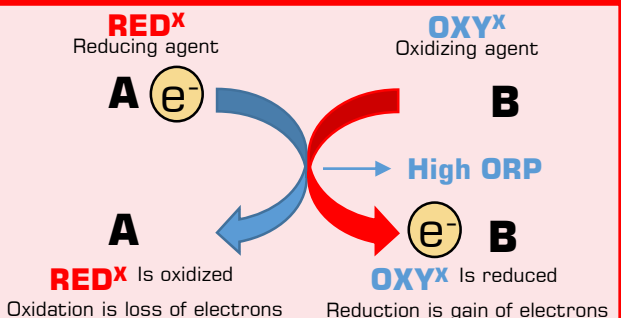
The reaction mechanisms of



which makes **REDOXY** based

Advanced Oxidation Technology unique.

The highest oxidation reduction potential (ORP)
2.2 (Ferrate) + 2.7 (HRs) + 3.1 (SRs) = 8.0



Our Scientific Disciplines Include

REDOXY-3C

Known as

"GREEN TREATMENT"

&

GREEN Chemical

The application of RED (Ferrate VI) in various applications of **Watch-Water** is associated with a **NON-TOXIC** by products which exaggerate its application in many different applications. As described **Red-Oxy** is an Adsorber FeOOH which is rendered as non-toxic chemical hence, the **REDOXY** treatment is absolutely free from the toxic of by products. Therefore, the entire treatment is known as the **GREEN-TREATMENT**

REDOXY-3C is known as unique **"Multifunctional"** with its green nature it is the chemical of **NEXT GENERATION** and could be used widely in future for the remediation of the aquatic environment. **REDOXY** is an emerging

- Water Treatment Disinfectant
- Adsorbent
- Strong Oxidant for Chemical Oxidation
- Strong Reduction and Stabilization Agent

Without any concerns of Disinfection by products. In **REDOXY-3C** there is not one chemical used, such as Chlorine, Chloramines or Ozone.



Because **REDOXY-3C** is the stronger Oxidizer with its highest capacity, **REDOXY** is employed to degrade almost all **INORGANIC** and **ORGANIC** impurities in all kind of water's such as,

- Surface Water
- Ground Water
- Waste Water

Above Water's with high,

Aliphatic and Aromatic organic compounds. The Application of **REDOXY-3C** will destroy all kind of Alcohols, Carboxylic compounds Amino acids, Phenol, Organic, nitrogen and Sulphur containing compounds. The degradation is fact and the increase of **REDOXY-3C** dose can treat all water within 24 Hours after application.

APPLICATION OF **REDOXY** for further Pollutants include, Arsenic, Selenium, Nitrogen, Hydrogen Sulfide, dissolved Ammonia, Heavy Metal, Toxic Ions, Cyanide, Hydroxylamine's, theorem, Thioacetamide and much more. This treatment is absolutely different that all other treatment's in the Water treatment Industry.

DEGRADING OF ENDOCRINE (EDCs)

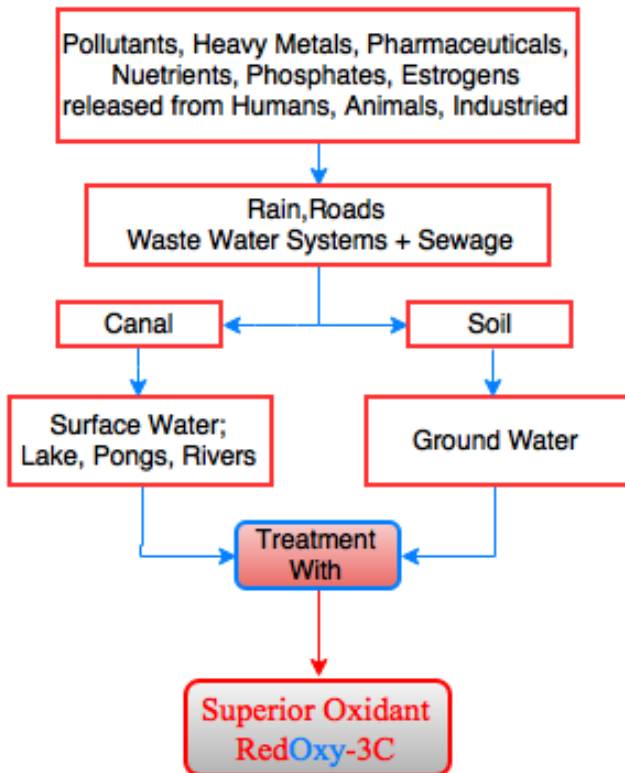
An Endocrine is defined by Watch Water as "An Exogenous agent that interferes with the synthesis, secretion, transport, binding, action of elimination of natural hormones in the body that are responsible for the maintenance of homeostasis, reproduction, development, and/or behavior".

REDOXY-3C
TREATMENT

There is a very broad class of EDCs chemicals which also includes natural estrogens such as Estrone (E1). These Estrone & Endocrine are found in the aquatic environment. All **Wastewater treatment Plants** and Sewage Plants are the major source of releasing (EDCs) into the Environment and then into Surface water/lakes, rivers, ponds including groundwater.

Treatment based on REDOXY-3C technology is most successful because of the following reasons.

1. High Oxidation Potential of RED^X Non-toxic by products generated by Oxydes-P
2. Fast and effective Adsorption of Contaminants



Watch-Water has given a great importance to remove the **“Non-Degradable”** impurities like.

- Toxic Heavy Metals
- Radionuclides
- Adsorption of Metals Cations/Anions

The above metallic impurities are present in the Surface Waters, Ground water and Waste water, either in its free form or in its complexed form. REDOXY as discussed a very strong Oxidant with Excellent Adsorption properties hence, able to Adsorb these impurities and can be removed with **Crystolite** or **Katalox-Light** Filtration. More over the (FeOOH) as iron hydroxide Is known to be a **“Potential Adsorbent”** can remove the free metallic impurities by **Adoption Process**. The complete oxidation take place within a second. REDOXY has the efficiency to remove the Arsenic from the arsenic contaminated water from rivers, ponds, surface waters and ground water just in a second. REDOXY is a potential technology to remove toxic Cations/Anions including Radionuclides via 3 Combined processer.

- a) Oxidation/Disinfection
- b) Coagulation
- c) Adsorption and finally filtration through
 - Crystolite or
 - Katalox-Light.

As communities scramble to find a suitable Neat and clean solution for any contaminated water, Watch Water Group believes REDOXY-3C is the answer. There is no other technology in the market like REDOXY-3C. This Combined Technology could not be more perfectly suited to clean all contaminated water's. It's so simple.

Technical Datasheet

CERTIFICATION

REDOXY-3C meets or exceeds all **American Water Works Association (AWWA)** standard and **ANSI/NSF** standard 60. This product is certified for use in potable water treatment up to 300 mg/liter.

Production/Distribution

REDOXY-3C is produced in Germany by **Watch-Water®** and also distributing it worldwide through **Watch-Water®** branched.

Watch-Water® has branches in:

Australia, Asia, Europe, Middle East, Africa, America, Canada, South America

The Technology

REDOXY-3C core technology is a proprietary catalyst material, an assembly of three different particles that purifies water without being degraded. **OXY^x** is the only formulation which has to be applied again. **RED^x** and **ADSORB^x** can be used multiple times by minimizing waste and disposal problems associated with physical water treatment technologies which collects and adsorbs contaminates and **OXY^x** breaking them down

Redoxy Product Specification

Dosage	30 gram Max/m ³ of water
Appearance	White/Grayish Granules
Total Redoxy	100% Total
	RED ^x 60%
	OXY ^x 30%
	ADSORB ^x 10%
Bulk Density	1.2 kg/liter
Particle size	3-5mm

Dosing of REDOXY-3C

REDOXY-3C works in wide range of pH and can be use for odor removal, Turbidity, Coagulation, Color removal, nutrients removal, Hydrogen Sulfide removal, Phosphate removal and heavy metal removal

Dosage Max	30 mg/liter OR 30 grams/m ³ of water OR waste water treatment
------------	---

STORAGE AND PACKAGE

The **REDOXY-3C** granules are mildly hygroscopic and therefore should be stored in dry condition

Package: 60kg drums or 4/5 kg bags in box.

For in depth information on **REDOXY** treatment, please find the **REDOXY** brochure on **Watch Water** website.

Documented by: Watch Water GmbH | Fahrlachstr. 14 D-68165 Mannheim Germany

