**RedOxy - 3C**

Combined Treatment Technologies

Surface Water/Waste Water Treatment Plant

Watch Water Solution

Advantages
- No Chlorine
- No Flocculent/Alum
- No Acids
- No DBPs
- No Ozone

Application
- Irrigation
- Horticulture
- Agriculture
- Mining

All Problem → One 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

www.watchwater.de
What is Red\textsuperscript{3X}?

The element of Red\textsuperscript{3X} is iron which is one of the metals in periodic table that is named as “Transition Metal”. This is the secret of Red\textsuperscript{3X} 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\textsubscript{4}\textsuperscript{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(VII)] can be utilized to create Fenton’s Reaction (activation of \textsubscript{2}H\textsubscript{2}O\textsubscript{2} with Red\textsuperscript{3X}) 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\textsuperscript{3X} values).

Since Red\textsuperscript{3X} has now been changed to a catalyst all sulfates in composition of OXY\textsuperscript{3X} generates Sulfate Radicals (SRs) with a redox potential of 2.5 – 3.1 Volts. Heterogeneous generation of Sulfate Radicals has now changed dissolved Red\textsuperscript{3X} ions into the solid phase. Metallic hydroxide (FeOOH) particles (as adsorbent) can be easily removed by KATALOXLIGHT\textsuperscript{®} 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

RED\textsuperscript{1} + OXY\textsuperscript{1} → OXY\textsuperscript{2} + RED\textsuperscript{2}

RED\textsuperscript{1} and RED\textsuperscript{2} are both Reducers
OXY\textsuperscript{1} and OXY\textsuperscript{2} are both Oxidizers

Each pairs

RED\textsuperscript{1} / OXY\textsuperscript{2}
OXY\textsuperscript{1} / RED\textsuperscript{2}

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
Red\textsuperscript{3X} + OXY\textsuperscript{3X} + ADSORB\textsuperscript{3X} 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 REDOX 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”.

[www.watchwater.de](http://www.watchwater.de)
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 REDOXY-3C 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) and NSF/ANSI-60 by WQA standard.

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. OXY³X is the only formulation which has to be applied again. RED³X and ADSORB³X can be used multiple times by minimizing waste and disposal problems associated with physical water treatment technologies which collects and adsorbs contaminates and OXY³X breaking them down

Redoxy Product Specification

<table>
<thead>
<tr>
<th>Dosage</th>
<th>30 gram Max/m³ of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White/Grayish Granules</td>
</tr>
<tr>
<td>Total Redoxy</td>
<td>100% Total</td>
</tr>
<tr>
<td>RED³X</td>
<td>40%</td>
</tr>
<tr>
<td>OXY³X</td>
<td>20%</td>
</tr>
<tr>
<td>ADSORB³X</td>
<td>40%</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>1.2 kg/liter</td>
</tr>
<tr>
<td>Particle size</td>
<td>3-5mm</td>
</tr>
</tbody>
</table>

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

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<thead>
<tr>
<th>Dosage Max</th>
<th>30 mg/liter OR 30 grams/m³ of water OR waste water treatment</th>
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</thead>
</table>

STORAGE AND PACKAGE

The REDoxy-3C granules are mildly hydroscopic and therefore should be stored in dry condition

Package: Product is available in 60 kg drums.

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

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