KEEP IN COOL DRY PLACE

CAUTION: For INSTITUTIONAL or INDUSTRIAL USE ONLY!

SEE SIDE PANEL FOR ADDITIONAL CAUTIONS

CONTENTS: ACTIVE INGREDIENTS: Chlorine Dioxcide 5%; INERT INGREDIENTS: 95%.

U.S.D.A. Reg. No. 9150-2 Pat. No. 3,123,521 No. 3,082,146

MANUFACTURED BY
INTERNATIONAL DIOXCIDE, INC. NEW YORK N Y

NOTE:

All working solutions must be adjusted to pH of approximately 4.0 prior to use, employing acetic acid (vinegar), citric acid or suitable buffer, or added to a medium which will result in a final pH of 4.0.

DIRECTIONS FOR USE:

HOSPITALS, DISINFECTION:

Walls, floors, drains, etc. — Effective against Staphylococcus aureus. Treat with 1:60 (2¼ fl. oz. per gallon) solution of ANTHIUM DIOXCIDE.

Bed Pans — Thoroughly cleaned bed pans may be disinfected by soaking in a 1:60 (2¼ fl. oz. per gallon) solution.

Fabric Disinfection — After washing, soak fabrics in a 1:60 (2¼ fl. oz. per gallon solution of ANTHIUM DIOXCIDE.

GENERAL:

For sanitization and odor control, ANTHIUM DIOXCIDE may be applied after thorough cleaning, as a wash in the following:

Meat Processing Plants	Poultry Processing Plants	Mortuaries
Industrial Processing Plants	Poultry Hatcheries	Boats
Fish Processing Plants	Dairies	Flour Mills
	Food Processing Plants	

Walls, floors, drains, etc. — Treat with 1:128 dilution (1 fl. oz. per gallon).

Sink soaking of previously cleaned utensils, heavily stained dishes and glasses, equipment parts, etc. — Soak in a 1:128 dilution (1 fl. oz. per gallon). Fill and hold for 20 minutes. Drain and flush with potable water before reuse.

Pipe lines — Fill system with a 1:128 dilution (1 fl. oz. per gallon). Flush equipment with potable water rinse before reuse.

MEAT PROCESSING PLANTS:

For control of mold, mildew and bacteria —

Walls, ceilings, floors — Spray or soak with a dilution up to 1 part ANTHIUM DIOXCIDE and 20 parts water.

For Sanitization —

Cutting surfaces, utensils, equipment — Treat with 1:128 (1 fl. oz. per gallon) solution of ANTHIUM DIOXCIDE. Soak for 20 minutes. Rinse thoroughly with potable water.

FISHING BOATS:

After thorough cleaning, the walls, decks and ceilings may be sanitized by washing with a 1:128 dilution (1 fl. oz. per gallon, of ANTHIUM DIOXCIDE. Rinse thoroughly with potable water.

CAUTION:

Harmful if swallowed. If taken internally, contact a physician. Avoid contact of concentrated material with skin. Avoid contact with eyes. In case of contact, wash thoroughly with water. If irritation persists, contact a physician. Rinse empty container thoroughly with water and discard it.

INTERNATIONAL DIOXCIDE, INC.
518 FIFTH AVENUE, NEW YORK, N.Y. 10036

TECHNICAL BULLETIN

ANTHIUM DIOXCIDE®

A stable Chlorine Dioxide Complex

Concentrated (50,000 ppm) in aqueous solution

A powerful basic chemical now commercially

available in a form that is safe

and easy to use

A new tool for industries and municipalities

concerned with chemical and microbiological problems.

U.S. Patents-3,147,124
3,082,146
3,123,521

U.S.D.A. Registration No. 9150-2

Bulletin No. 598

ANTHIUM DIOXCIDE PROPERTIES

Chlorine dioxide has long been recognized as an effective antimicrobial agent. Its excellent bactericidal, fungicidal and odor control properties are widely known. Now in convenient solution form with control of sustained release, ANTHIUM DIOXCIDE is providing a means of using ClO_2 in products and processes where previously available unstable solutions of ClO_2 gas were not practical.

The ANTHIUM DIOXCIDE complex is a combination of oxygen and chlorine joined as ClO_2 in aqueous solution. It is now commercially available as a drum-packaged concentrate. It is easy to use and safe to store. When used as directed, it is odorless and tasteless.

Typical Properties

ClO_2, Available Concentration at 5°-50° C	50,000 ppm
Specific Gravity	1.063
Boiling Point	214°F
Freezing Point	10.5°F
pH	8.6
Sodium Carbonates (Na_2CO_3 and $NaHCO_3$)	3.65 %
Chlorine Dioxide	5.00 %
Water	91.35 %
Stability	Shelf life exceeds one year.
Solubility	Completely miscible with water.
Corrosion	Non-corrosive to metals in dilution normally used. Slightly corrosive to most metals in concentrated form.
Package	52 gal. vented polyethylene-lined drums, net weight: 463 lbs.

DILUTION CHART

Ounces per gallon of water	ppm ClO_2
1/8	50
1/4	100
1/2	200
3/4	300
1	400

ACTIVATING THE OXIDIZING POWER OF ANTHIUM DIOXCIDE CAN BE ACCOMPLISHED IN SEVERAL WAYS

Since ANTHIUM DIOXCIDE is a stable aqueous solution, it is not subject to the usual rapid decomposition of chlorine dioxide in water. The chlorine dioxide can be activated from this stable solution with sustained release by several methods:

1. Reducing pH by introducing into media below 7 pH. The lower the pH, the faster the rate of release of ClO_2.

2. Reaction with microorganisms which have acidulous structure. Release of ClO_2 at point of contact with such organisms can be obtained even in neutral or slightly alkaline media.

3. Mixing with acidic material just prior to introduction into alkaline media.

4. Introduction to media containing chlorine.

5. Raising temperature above 145°F in neutral solutions.

SPECIFIC ClO_2 AVAILABILITY TABLE

ANTHIUM DIOXCIDE
per million gallons:

GALLONS	POUNDS	FEED RATE cc/min. per MGD	PPM ClO_2
2	17.7	5.25	.1
4	35.4	10.5	.2
6	53.1	15.8	.3
8	70.8	21.0	.4
10	88.5	26.3	.5
12	106.2	31.6	.6
14	123.9	36.7	.7
16	141.6	42.0	.8
18	159.3	47.2	.9
20	177.0	52.5	1.0
40	354.0	105.0	2.0
60	531.0	157.8	3.0
80	708.0	210.4	4.0
100	885.0	263.4	5.0

ANTHIUM DIOXCIDE

RECOMMENDED USE STRENGTHS

PAPER MILL TREATMENT

Although most mills are equipped to do a large share of their water treatment with chlorine, many find it necessary to give supplemental treatment to control slime.

ANTHIUM DIOXCIDE, when used as directed in white water, will control slimes, clumps, tar spots and pitch spots. There is no immunity build-up against it. It will not react with commonly used fibers, fillers or dyes. Nor does it have deleterious effect on wires or felts.

It is not necessary to kill slime-forming microorganisms to keep slime from growing in the white water system. By maintaining a ClO_2 atmosphere in the white water with ANTHIUM DIOXCIDE, a condition is accomplished where microorganisms cannot produce the nodules which result in slime. 4 1/2 gallons of ANTHIUM DIOXCIDE per 100 tons of paper produced maintains this atmosphere. In many cases the amount can be reduced after the system is clean.

By a quantitative chemical titration, procedure can be established to insure a feed rate that insures residual ClO_2 in all parts of the white water system. Quality control can thereby be accomplished by a method practical in any mill.

Where white water is above pH 7, 1/2 gallon of 50% sodium hypochlorite should be added as an activator with each 4 1/2 gallons of ANTHIUM DIOXCIDE. Continuous proportioning feed is recommended for best results. Multiply gallons of ANTHIUM DIOXCIDE by 2.63 to get millilitres per minute.

ANTHIUM DIOXCIDE has been helpful in controlling slime in starch and alum vats over shut down periods. Let us consult with you to suggest experimental procedure for investigating possible solution for your particular problem on shut downs.

POTABLE WATER TREATMENT

ANTHIUM DIOXCIDE is especially valuable for removing taste and odors from potable waters. Use as a polishing treatment for waters containing sulphides, chlorophenols or buylamine and other organic materials contributing to objectionable taste and odors.

Chlorinate water in normal fashion for disinfection. Then, at, or just before, the clear well, add ANTHIUM DIOXCIDE by proportioning pump or gravity feed. Use up to 40 ppm ClO_2. For removal of chlorophenol taste use 1 gallon of ANTHIUM DIOXCIDE for each million gallons for each 50 ppm of phenol present in chlorinated water.

ANTHIUM DIOXCIDE in conjunction with calcium hypochlorite and sodium hexametaphosphate has proved useful in removing filamentous scale in wells. See article, pages 54 - 55, in Water and Waste Engineering Publication - Dec. 1967. Reprints are available. Write us.

WASTE PLANT SLUDGE DEODORIZING

1. Spray diluted ANTHIUM DIOXCIDE over sludge pits (dilution 1 gallon per 50 gallons of water). Repeat upon first indication of odor reoccuring.

2. Feed to liquid waste systems after primary treatment (at rate of 1 to 2 gallons per million gallons of waste) to get marked odor reduction.

HOSPITALS - NURSING HOMES

The removal of odors from rooms of terminal patients coupled with the ability of ANTHIUM DIOXCIDE to sanitize and disinfect makes it an excellent tool for hospital application.

Odor control. Spray or wash with a dilute solution of ANTHIUM DIOXCIDE on floors, urinals, walls, etc. (Use from 1 to 2 1/2 fl. oz. per gallon of water.)

Disinfectant: For fabrics, walls, floors, drains, etc. Effective against Staphylococcus aureus. After thorough washing treat with 1:60 (2 1/2 fl. oz. per gallon) solution (800 ppm ClO_2) which has been adjusted to pH of approximately 4.0 pH employing acetic acid (vinegar) or suitable buffer.

SANITIZING AND ODOR CONTROL

For walls, floors, equipment, utensils in bakeries, breweries, restaurants, taverns, hospitals and fisheries use 1 oz. ANTHIUM DIOXCIDE per gallon of water and acidify to approximately 4.0 pH with citric, acetic or phosphoric or other suitable buffer. Apply by soaking, mopping, or flushing with potable water after 20 minutes contact time.

COOLANTS AND CUTTING OILS

The action of ANTHIUM DIOXCIDE as a bacteriostat reduces objectionable odors from metal working coolants and oil suspensions.

Batch Method--Add 1 quart of ANTHIUM DIOXCIDE per 1,000 gallons system and repeat weekly or on first indication of slight adverse odor. In alkaline systems add 1 oz. of formaldehyde with each quart of ANTHIUM DIOXCIDE.

Continuous Method--Proportion 2 gallons of ANTHIUM DIOXCIDE per 1,000 gallons per day used in the system. Multiply gallons of ANTHIUM DIOXCIDE per day by 2.63 to get millilitres per minute. In alkaline systems add 1 pint of formaldehyde daily per each gallon of ANTHIUM DIOXCIDE. This method prevents development of odor problems by preventing microorganisms from producing objectionable nodules.

To deodorize already contaminated systems slug dose with 10 gallons ANTHIUM DIOXCIDE per million gallons of coolant, followed after 24 hours by 1 gallon of formaldehyde per million gallons of coolant. Then use continuous procedure described above.

ANTHIUM DIOXCIDE is undergoing investigation and development for the

Starch Bleaching	Deodorizer
Bleaching of Chemical Products	Air Purific
Seafood Preservation	Soil Treatm
Vegetable Preservation	Prevention
Fruit Preservation	Seed Prese
Clothing Deodorizing	Mildew Pr
Prevention of Bacterial Growth in Yogurt Culture	Deodorizin

MISCELLANEOUS USES

ANTHIUM DIOXCIDE is being commercially used in several industries as follows:

Control of odor caused by bacteria in resins, casein, adhesives, sugar and gum solutions.

Although information on these uses is not publicly available from the companies involved, we can supply you with suggestions to guide you in your evaluation of the efficacy of ANTHIUM DIOXCIDE for your particular problem.

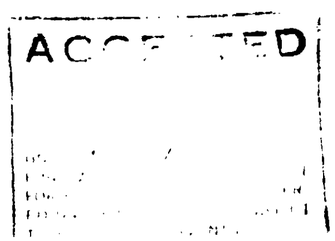
* New Applications:

Several other applications for ANTHIUM DIOXCIDE are being researched. Extension of shelf life in cottage cheese, vegetables, and seafood products is showing great promise. Studies in prevention of mold and fungus on fruit is continuing to an advanced stage. Applications in cosmetics and toiletries are being studied. The controlled release of ClO_2 for "in situ" oxidation in chemical processes has opened new possibilities in several industries.

May we help you solve a problem with ANTHIUM DIOXCIDE?

Our technical staff will be glad to assist you in determining proper application of ANTHIUM DIOXCIDE. For specific information on suggested quantities for investigation and the manner of application, or advice on new applications, please write to us c/o Product Development Department, Fifth Floor, 518 Fifth Avenue, New York, New York 10036.

* These new applications have not been registered with U.S.D.A.



CARNEBON® 200

KEEP IN COOL DRY PLACE

CAUTION: For INSTITUTIONAL or INDUSTRIAL USE ONLY!

SEE SIDE PANEL FOR ADDITIONAL CAUTIONS

CONTENTS: ACTIVE INGREDIENTS: Chlorine Dioxide 2.00% ; INERT INGREDIENTS: 98.00%

U.S.D.A. Reg. No. 9150-3 Pat. No. 3,123,521 No. 3,082,146

MANUFACTURED BY
INTERNATIONAL DIOXCIDE, INC. NEW YORK, N. Y.

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FOOD PROCESSI

1. Poultry P

2. Meat Pr

3. Ice Plants

FOR SANITIZAT