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PREFURAN

(Nifurpirinol, 10% compression)

A PREVENTIVE AND CURE FOR
BACTERIAL, FUNGAL AND PARASITIC
DISEASES OF FISHES AND OTHER
AQUATIC ANIMALS.

INTRODUCTION

The fundamental goal of aquaculture is the evolution of technology leading to the cost efficient production of aquatic animals. This goal is motivated by a world protein shortage, as well as a declining global "capture fisher" resource. By the year 2000, the "capture fishery" industry with its' burdensome fuel requirements and diminished resource will be viewed as archaic. Escalating land costs will force aquaculture to evolve from an extensive technique to an intensive, high density, technology.

Disease problems become increasingly significant under intensive, high density aquaculture techniques. correspondingly, there is a need for significant improvements in therapeutants. **PREFURAN** stands alone as a safe, effective and broad spectrum prophylaxis and therapy for diseases of fishes and other aquatic animals (1) (2) (3).

PREFURAN is a highly strategic treatment because it is rapidly absorbed, metabolized and excreted from aquatic animals. When administered as indicated, **PREFURAN** leaves no detectable tissue residues after bathing in fresh water for several hours (3).

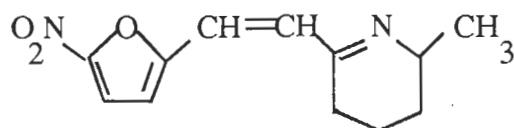
CHEMISTRY

PREFURAN is a 10% extruded compression of nifurpirinol in a carbohydrate base. Nifurpirinol has several chemical names including:

6-[2-(5-Nitro-2-Furanyl) Ethenyl] - Pyridinemethanol
6-[2-(5-Nitro-2-Furanyl) vinyl] 2-Pyridinemethanol
6-(Hydroxymethyl) - 2- [2-(5-Nitro-2-Furanyl) vinyl] - Pyridine

Other nomenclatures include: Furpirinol, Furpyrinol, P-7138 and Furanace.

The Structural Formula is represented as:



The empirical formula is: $C_{12}H_{10}N_2O_4$
The molecular weight is: 246.22 a.m.u.
The elemental composition is C; 58.54%, H; 4.09%, N; 11.38%, O; 25.99%
The melting point is: 170 - 171 degrees C.
The color (as commercial 10% compression) is: Pale Yellow
Aqueous solubility at 25 degrees C (100% active basis) is: 10.3 ppm.

PHARMACOLOGY

PREFURAN brand name of nifurpirinol 10%, has been shown to undergo rapid absorption across the gill space in finned fishes, shellfish and eels (5). Significantly, the drug is rapidly distributed to the organisms tissues and achieves therapeutic levels within minutes after bathing has commenced. **PREFURAN** is rapidly excreted from treated animals leaving no detectable residues within several hours after introduction to fresh water.

The antibacterial action of **PREFURAN** is believed to be related to its ability to inhibit the synthesis of DNA within bacterial cells (4). this mechanism is common among the Nitrofurans family of drugs. The ability of **PREFURAN** to kill fungi and protozoan parasites such as Saprolegnia and ichthyophthirius (Ich) may be related, but has not been exclusively established.

TOXICOLOGY

the toxicology of **PREFURAN** brand of Nifurpirinol has been extensively studied and reported in the literature (1), (3). The compound shows an LC_{50} at 10 minutes exposure of greater than 30 ppm (100% active material). LC_{50} for one day exposures were in the range 4 to greater than 30 ppm (100% active ingredient). (The LC_{50} is defined as the median concentration which will kill 50% of a test population under fixed conditions for a given time interval). Oral toxicity in mice (LC_{50}) on intraperitoneal injection was greater than 200 mg/kg (6). Thus **PREFURAN** has a wide margin of safety for use on aquatic species.

INDICATIONS

SPECIES: Marine and freshwater fishes, shellfish, eels, etc.
DISEASES: Bacterial infections of Aeromonas (Hydrophila, Salmonicida, etc.)
Bacterial infections of Vibrio Anguillarum (Vibriosis)
Bacterial infections of Chondrococcus/Flexobacter Columnaris
Fungal infections of Saprolegnia
Parasitic infections of Ichthyophthirius Multifiliis - "Ich" or white spot.
For general prophylaxis of surface abrasions, wounds and lesions.

ADMINISTRATION AND DOSAGE

Before prophylaxis or treatment is undertaken it is important to recall that the efficiency of a given procedure will vary among species. Additionally, differences in water parameters including temperature, dissolved oxygen, ammonia level, Ph hardness, as well as other will affect treatment. Therefore, IT IS IMPORTANT TO MAKE THE TREATMENT ENVIRONMENT AS SIMILAR AS POSSIBLE TO THE HABITAT. Observe the following rules:

- * Temperature of treatment bath should be similar to habitat.
- * Aerate treatment solutions to maintain a favorable dissolved oxygen level.
- * Test several fish before doing large groups.
- * Observe the dosage outlined below.
- * If edible fish are to be treated, a minimum 5 day withdrawal before slaughter is suggested.

The following dose regimens are suggested for **PREFURAN**.

TREATMENT REGIMEN I - 3 to 5 day bath at 0.05 to 0.1 ppm of active ingredient. Use the following table to calculate grams of **PREFURAN** per liters or gallons of water.

<u>Water Volume (Liters)</u>	<u>Approximate Gallons</u>	<u>Grams of Prefuran</u>
100 L	25 gal.	.05 to .10 grams
200	50	.10 to .20
300	77	.15 to .30
400	100	.20 to .40
500	125	.25 to .50
600	150	.30 to .60
700	175	.35 to .70
800	200	.40 to .80
900	225	.45 to .90
1000	250	.50 to 1.0
10000	2500	5.0 to 10.0

TREATMENT REGIMEN II - 15 to 30 minutes bath at 1.0 to 2.0 ppm of active ingredient. Use the following table to calculate grams of **PREFURAN** per liters or gallons of water.

<u>Water Volume (Liters)</u>	<u>Approximate Gallons</u>	<u>Grams of Prefuran</u>
100 L	25 gal.	1.0 to 2.0 grams
200	50	2.0 to 4.0
300	75	3.0 to 6.0
400	100	4.0 to 8.0
500	125	5.0 to 10.0
600	150	6.0 to 12.0
700	175	7.0 to 14.0
800	200	8.0 to 16.0
900	225	9.0 to 18.0
1000	250	10.0 to 20.0
10000	2500	100 to 200

It is suggested that the weight of fish to be treated not exceed 25% of the weight of water in the treatment bath. For best results, do not reuse bath water.

PACKAGING

PREFURAN is available in:

- 20 x 5 gram pre-weighed vials
- 100 gram amber glass bottles
- 1000 gram amber glass bottles

STORAGE

Store **PREFURAN** at room temperature or below. Avoid contact of treatment with solutions with sunlight as the product is photochemically reactive.

*Disclaimer, Manufacturers assume no liability, expressed or implied in the applications of this product. **PREFURAN** is not federally registered for use in edible fish in some countries. **PREFURAN** is sold in the U.S.A. for ornamental fish use.

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