Fluorescent Brightener 28

sc-218504

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Fluorescent Brightener 28

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800
EMERGENCY:
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C40-H44-N12-O10-S2, "2, 2' -stilbenedisulfonic acid, 4, 4' -bis[(4-anilino-6-bis(2-", hydroxyethyl)-, amino-s-triazin-2-yl)amino]-, "benzenesulfonic acid, 2, 2' -[1, 2-ethenediyl)bis[5(4-(bis(2-hydroxyethyl)-", "amino)-6-(phenylamino)-1, 3, 5-triazin-2-yl)amino]-", "C.I. 40622", "Tinopal UNPA-GX"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	0		
Body Contact:	2		
Reactivity:	1		
Chronic:	0		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Irritating to eyes.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Limited evidence exists that the substance may cause irreversible but non-lethal mutagenic effects following a single exposure.
■ The material has NOT been classified as "harmful by ingestion".
This is because of the lack of corroborating animal or human evidence.

EYE

■ This material can cause eye irritation and damage in some persons.

SKIN

■ The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
■ Limited evidence exists that the substance may cause irreversible but non-lethal mutagenic effects following a single exposure.

CHRONIC HEALTH EFFECTS

■ Exposure to the material may result in a possible risk of irreversible effects. The material may produce mutagenic effects in man. This concern is raised, generally, on the basis of
appropriate studies with similar materials using mammalian somatic cells in vivo. Such findings are often supported by positive results from in vitro mutagenicity studies.
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.
Exposure to fluorescent brighteners should be kept to a minimum. Skin inflammation can occur in prolonged exposure.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
C.I. Fluorescent Brightener 28	4404-43-7	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

· Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

■ If skin or hair contact occurs: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

INHALED

· If dust is inhaled, remove from contaminated area. · Encourage patient to blow nose to ensure clear passage of breathing. · If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

■ Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	Not available
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA
· Foam.
· Dry chemical powder.

FIRE FIGHTING
· Alert Emergency Responders and tell them location and nature of hazard.
· Wear breathing apparatus plus protective gloves.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
· Combustible solid which burns but propagates flame with difficulty.
· Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
Combustion products include: carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NOx), sulfur oxides (SOx), other pyrolysis products typical of burning organic material.
May emit corrosive fumes.

FIRE INCOMPATIBILITY
■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids,chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION
Glasses:
Chemical goggles.
Gloves:
Respirator:
Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
· Clean up all spills immediately.
· Avoid breathing dust and contact with skin and eyes.
MAJOR SPILLS
■ Moderate hazard.
· CAUTION: Advise personnel in area.
· Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of exposure occurs.
Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
· Do NOT cut, drill, grind or weld such containers.
· In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS
· Lined metal can, Lined metal pail/drum
· Plastic pail.

STORAGE REQUIREMENTS
· Store in original containers.
· Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

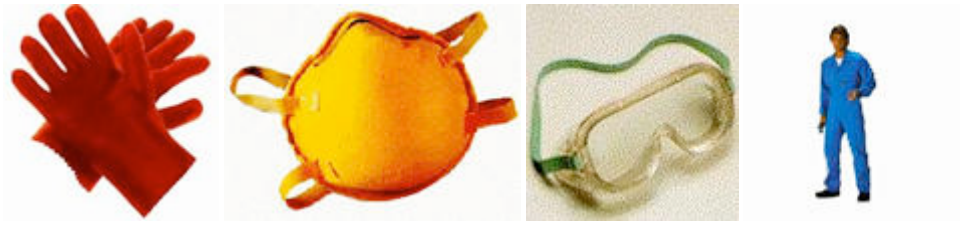
EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
Canada - Ontario Occupational Exposure Limits	C.I. Fluorescent Brightener 28 (Particles (Insoluble or Poorly Soluble) Not Otherwise)		10 (I)						
Canada - British Columbia Occupational Exposure Limits	C.I. Fluorescent Brightener 28 (Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))		10 (N)						
Canada - Ontario Occupational Exposure Limits	C.I. Fluorescent Brightener 28 (Specified (PNOS) / Particules (insolubles ou peu solubles) non précisées par ailleurs)		3 (R)						
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	C.I. Fluorescent Brightener 28 (Particulates not otherwise regulated Respirable fraction)		5						
US - California Permissible Exposure Limits for Chemical Contaminants	C.I. Fluorescent Brightener 28 (Particulates not otherwise regulated Respirable fraction)		5						(n)
US - Oregon Permissible Exposure Limits (Z-1)	C.I. Fluorescent Brightener 28 (Particulates not otherwise regulated (PNOR) (f) Total Dust)	-	10						Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means “particles not otherwise regulated.”
US - Michigan Exposure Limits for Air Contaminants	C.I. Fluorescent Brightener 28 (Particulates not otherwise regulated, Respirable dust)		5						

US - Oregon Permissible Exposure Limits (Z-1)	C.I. Fluorescent Brightener 28 (Particulates not otherwise regulated (PNOR) (f) Respirable Fraction)	-	5	Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means “particles not otherwise regulated.”
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	C.I. Fluorescent Brightener 28 (Particulates not otherwise regulated (PNOR)(f)-Respirable fraction)		5	
Canada - Prince Edward Island Occupational Exposure Limits	C.I. Fluorescent Brightener 28 (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)		10	See Appendix B current TLV/BEI Book

ENDOELTABLE

PERSONAL PROTECTION



RESPIRATOR

•Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE

· Safety glasses with side shields.
· Chemical goggles.

HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.

· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

· polychloroprene
· nitrile rubber
· butyl rubber
· fluorocaoutchouc
· polyvinyl chloride

Gloves should be examined for wear and/ or degradation constantly.

OTHER

· Overalls.
· P.V.C. apron.
· Barrier cream.
· Skin cleansing cream.
· Eye wash unit.

ENGINEERING CONTROLS

· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
· Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.
Does not mix with water.

State	Divided solid	Molecular Weight	916.98
Melting Range (°F)	554 (decomposes)	Viscosity	Not Applicable
Boiling Range (°F)	Not applicable	Solubility in water (g/L)	Partly miscible
Flash Point (°F)	Not available	pH (1% solution)	Not applicable
Decomposition Temp (°F)	554	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	Not available
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

APPEARANCE

Yellow powder; does not mix well with water.

C.I. Fluorescent Brightener 28/113 (K/Na- and Na2-salts) is a yellowish solid without odour, with a melting point of 322 C (K/Na-salt), 260 C (Na2-salt), and 290 C (free acid). According to the structure of the substance and to decomposition starting at 351 C, boiling point and vapor pressure are not measurable. The substance is soluble in water with 27.1 g/l (K/Na-salt, at 20 C [OECD TG 105]), 50 g/l (Na2-salt, at 20 C), and 80 g/l (free acid, at 25 C). The bulk density of the Na2-salt is 340 kg/m3. A log Kow of 3.23 is estimated for the undissociated form of the free acid and a log Kow of limited value of 0.65 for the salts of C.I. Fluorescent Brightener 28/113.

Material	Value

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

■ Product is considered stable and hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

■ Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

C.I. Fluorescent Brightener 28

TOXICITY AND IRRITATION

C.I. FLUORESCENT BRIGHTENER 28:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
■ For C.I. Fluorescent Brightener 28/113 (and some congeners)

C.I. Fluorescent Brightener 28/113 is a technical product which is manufactured as the potassium/sodium salt (CAS No. 70942-01-7), dipotassium salt (CAS No 71230-67-6), disodium salt (CAS No. 4193-55-9), and free acid (CAS No. 4404-43-7). All these types of C.I. Fluorescent Brightener 28/113 are based on the identical organic disulfonates which determines the ecological and the toxicological properties. Additionally there are a number of very similar fluorescent whitening agents (congeners) with only minor

differences of the structure and very similar physical and chemical properties. These include:
(C.I. Fluorescent Brighteners 24, 220, 225, and the Fluorescent Brightener 4,4´-bis[4-anilino -6-[(2-hydroxyethyl)methyl-amino]-s-triazin-2-yl)amino]2,2´-stilbenedisulphonate = CAS No. 12224-02-1, 16470-24-9, 24019-80-5, and 13863-31-5, respectively).
Acute toxicity: The results of absorption/elimination/metabolism studies indicate virtually no absorption from the gut of the Fluorescent Brightener with CAS 13863-31-5 a chemically similar compound to C.I. Fluorescent Brightener 28/113. For this compound the faeces were the main elimination route. It is not metabolised in the gut. The excretion rate is solely dependent on the passage time through the gut.
The oral LD50 of C.I. Fluorescent Brightener 28/113 for rats is >15000 mg/kg.bw. The acute inhalation toxicity study showed a reversible and sporadic reduction of general health after 4 hours exposure to >1225 mg/m3 of rats. No pathological changes were seen in these animals. The 4h-LC50 value was >1895 mg/m3 air.
No indication for skin irritation was seen in several rabbit studies (24-hour semi-occlusive or occlusive applications of 500 mg) or in the available human data. Slight signs of eye irritation were recorded in one of three studies.
The C.I. Fluorescent Brightener 28/113 is considered not to be a skin sensitiser in a guinea pig maximization assay according to Directive 84/449/EEC, B.6. Acute toxicity (skin sensitisation).
Repeat dose toxicity: Dermal application (90 weeks) on male mice (3 times/week, 50 ul, 7.8 %) revealed no toxicity. Two 2 years oral feeding studies in rats with the C.I. Fluorescent Brightener 28/113 were performed. The NOEL for male rats was 54.1 mg/kg bw and day in one study (only slight reduction of body weight), the NOAEL for female rats was >= 779 mg/kg bw and day, the NOAEL for male rats was >=542.80 mg/kg bw/day. In the second study the NOAEL for female rats was >=10000 ppm (app. 500-1000 mg/kg bw /day). The NOEL for male rats was < 100 ppm because of an increased relative liver weight (up to 35 % at 10000 ppm) in male rats considered as adaptive effect. The NOAEL for male rats is considered to be >=10000 ppm, however, this is a borderline case.
Genetic toxicity: C.I. Fluorescent Brightener 28/113 is considered to be non-mutagenic as determined in vivo in a dominant lethal test with mice or in vitro up to 5000 ug/plate in Salmonella typhimurium strains TA1535, TA1537, TA98, TA100, and the Escherichia coli strain WP2 uvrA according to OECD TG 471. An in vitro cytogenetic study (chromosomal aberrations and sister chromatid exchanges) in Chinese hamster cells with a structurally very similar Fluorescent Brighteners (C.I. Fluorescent brighteners 24, and 225 = CAS No. 12224-02-1, and 24019-80-5) showed that these substances did not exhibit a potential to induce chromosomal aberrations nor sister chromatid exchanges. Another report describing the results of several tests in structurally very similar Fluorescent Brighteners (C.I. Fluorescent Brighteners 24, and 225 were tested) without giving experimental details (Ames Test in TA 100 TA 98; rec assay in Bacillus subtilis; Chromosomal aberrations in hamster lung fibroblasts and human embryo fibroblast; SCE in hamster lung fibroblasts and human embryo fibroblasts; chromosomal aberrations in rat bone marrow in vivo) confirmed the findings. Additionally no indication of mutagenic potential was found in the carcinogenicity studies conducted with these substances.
Carcinogenicity: No indication for a carcinogenic potential of the C.I. Fluorescent Brightener 28/113 was seen, neither after dermal administration (3 times/week, up to 50 ul, 7.8 %) to mice on irradiated skin, nor after chronic oral administration (up to 10000 pm) to rats respectively.
Reproductive and developmental toxicity: A study available as secondary citation only described C.I. Fluorescent Brightener 28/113 as having no effect on reproduction and teratogenicity. In addition, well documented lack of effects on reproduction in rats and rabbits were reported for the chemically related optical brightener C.I. Fluorescent Brightener 220 (CAS 16470-24-9). These reports support the notion for C.I. Fluorescent Brightener 28/113 to have no effects on fertility, developmental and teratogenic properties.
No significant acute toxicological data identified in literature search.

Section 12 - ECOLOGICAL INFORMATION

No data

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
C.I. Fluorescent Brightener 28	HIGH	No Data Available	LOW	LOW

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions
All waste must be handled in accordance with local, state and federal regulations.
¦ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:
· Reduction
· Reuse
· Recycling
· Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
· Recycle wherever possible.
· Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal

facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

Section 15 - REGULATORY INFORMATION

C.I. Fluorescent Brightener 28 (CAS: 4404-43-7) is found on the following regulatory lists;
"Canada Domestic Substances List (DSL)","International Council of Chemical Associations (ICCA) - High Production Volume List","US EPA High Production Volume Chemicals 1994 List of Additions","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE
■ Exposure may produce irreversible effects*.
* (limited evidence).

Denmark Advisory list for selfclassification of dangerous substances
Substance CAS Suggested codes C.I. Fluorescent Brightener 28 4404- 43- 7 Mut3; R68 R52/53

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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