

Product and Company Identification

Product Names: Allophycocyanin Conjugation Kit Catalog Number: D3-4500 Unit Size: 1 kit

Allophycocyanin Conjugation Kit R-phycoerythrin Conjugation Kit Catalog Number: D3-4500-2 Unit Size: 1 kit Catalog Number: D5-4500 Unit Size: 1 kit

Manufacturer/Supplier Columbia Biosciences

6440-D Dobbin Road Columbia, MD 21045 Phone: (443) 430-0403 Fax (443) 430-0407

Web: http://www.ColumbiaBiosciences.com

Composition/Information on Ingredients

Each Conjugation Kit includes:

- Activated fluorescent protein (R-Phycoerythrin or Allophycocyanin) provided as a lyophilized powder. Upon reconstitution with 1 ml distilled, deionized water, the resulting solution is 3.8 mg phycoerythrin in 100 mM sodium phosphate (pH 7.4), 150 mM sucrose, 150 mM sodium chloride, and 0.01% sodium azide..
- 2) Dithiothreitol (DTT) at 1M concentration in ddH20.
- 3) N-Ethylmaleimide (NEM) at 10mg/ml in DMSO.
- 4) Exchange Buffer -50 mM MES (pH 6.0), 2 mM EDTA
- 5) Storage Buffer -10 mM Tris (pH 8.2), 150 mM NaCl and 1mM pentachlorophenol

Handling and Storage

- Phycoerythrin is light and temperature sensitive. Store at 2-8°C and protect from long-term exposure to light. Do not freeze after resuspension.
- DTT -See Attached Supplement
- NEM -See Attached Supplement

Other Information

Pentachlorophenol is not present above permissible liquid limits and is not available as an inhalant
and sodium azide is not present in the mixture above 1%, therefore these materials are not
considered hazardous, as defined in 29 CFR 1910.1200 (OSHA Hazard Communication Standard).
Therefore, a Material Safety Data Sheet is not required. We recommend treating all chemicals with
caution.



Dihiothreitol

Section 1. Chemical Product and Company Identification '

Product Name Dithiothreitol (DTT)

Product no. 52105

Supplie**r** Manufacturer

Columbia Biosciences Pierce

6440-D Dobbin Road 3747 N. Meridian Road

Columbia MD 21045 P.O. Box 117
Tel: (443) 430-0403 Rockford, IL 61105
Fax: (443) 430-0407 815.968.0747 or
1.800.874.3723
(815)968-7316 fax

www.thermo.com

In case of *emergency* CHEMTREC:

800.424.9300 OUTSIDE US: 703.527.3887

Synonyms 2,3-Butanediol, 1,4-dimercapto-, (R*,R*)-(9CI); Cleland's reagent; D-threo-1,4-

Dimercapto-2,3-butanediol; (R*,R*) -1,4-Dimercapto-2,3-butanediol; 1,4-Dithiothreitol; D-1,4-Dithiothreitol; Sputolysin; Threitol, 1,4-dithio-; 1,4Dimercapto-2,3-Butanediol;

threo-2,3-dihydroxy-1,4-dithiobutane; DTT; No-WeighTM DTT

Use of the Refer to the instruction booklet for proper and intended use. Otherwise, contact

substance/preparation supplier for specific applications.

Section 2. Composition, Information on Ingredients

Substance/preparation Ingredient name (DTT)

CAS number 3483-12-3 98 -100

EC number 222-468-7

Classification Xn; R22 Xi; R36/37/38

Section 3 Hazards identification

United States Review the most current and approved institutional guideline, protocol, standard

operating procedure(s) and MSDS(s) for the proper handling of institutional

materials/equipment associated with the use of this product.

Emergency overview Warning!

CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

CAUSES DAMAGE TO THE FOLLOWING ORGANS: MUCOUS MEMBRANES,

RESPIRATORY TRACT, SKIN, EYES, CENTRAL NERVOUS SYSTEM. '

MAY BE HARMFUL IF SWALLOWED.

Do not ingest. Avoid contact with skin and clothing. Avoid breathing dust. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Target organs Causes damage to the following organs: mucous membranes, upper respiratory tract,

skin, eyes,

central nervous system (CNS).

Routes of entry Dermal contact.

Eye contact.
Inhalation.
Ingestion.

Potential acute health effects



Eyes Irritating to eyes. Skin Irritating to skin.

Inhalation Irritating to respiratory system.

Ingestion Harmful if swallowed.

Potential chronic health effects

MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for bacteria and/or

yeast.

TERATOGENIC EFFECTS: Not available.

Medical conditions Repeated exposure to a highly toxic material may produce general deterioration of

aggravated health by an accumulation in one or by overexposure many human organs.

Over-exposure Not available.

signs/symptoms

Europe

Classification Xn; R22

Xi; R36/37/38

Physical/chemical Not applicable.

hazards

Human health hazards Harmful if swallowed.

Irritating to eyes, respiratory system and skin.

Environmental hazards Not applicable.

See toxicological Information (section 11)

Section 4. First aid measures

Notice to reader Get immediate medical attention.

Effects and symptoms

Inhalation Hazardous in case of inhalation (lung irritant).

Ingestion Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching,

Very hazardous in case scaling, reddening, or, occasionally, blistering.

of ingestion. May be fatal if swallowed.

Skin contact

Eye contact Hazardous in case of eye contact (irritant).

Aggravating conditions Repeated exposure to a highly toxic material may produce general deterioration of

health by an accumulation in one or many human organs.

<u>First-Aid measures</u>

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is

difficult, give oxygen. Get medical attention immediately.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. Never give

anything by mouth to an unconscious person. Get medical attention.

Skin contact In case of contact, immediately flush skin with plenty of water for at least 15 minutes

while removing contaminated clothing and shoes. Wash clothing before reuse.

Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.

Get medical attention immediately.

Notes to physician Not available. Protection of first-aiders Not available.

Section 5. Fire fighting measures

Flammability of the May be combustible at high temperature.

product

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Flash Points Closed cup: 113°C (235.4°F).

Fire hazards in presence Not available.

of various substances

Fire fighting media and Use an extinguishing agent suitable for surrounding fires.

instructions

Protective clothing (fire) Be sure to use an approved/certified respirator or equivalent.

Hazardous thermal These products are carbon oxides (CO, CO2), sulfur oxides (SO2, SO3...). products

decomposition

Section 6. Accidental release measures

Personal precautions Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator

or equivalent. Gloves.

Environmental Stop leak if without risk. Do not get water inside container. Do not touch spilled

precautions and clean- material. Use water spray to reduce vapors. Prevent entry into sewers, basements or

up methods confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on

disposal.

Small spill and leak Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Section 7. Handling and storage

Handling Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use

only with adequate ventilation. Avoid breathing dust. Wash thoroughly after handling.

Storage Keep container tightly closed. Keep container in a cool, well-ventilated area.

Intended Use Refer to the instruction booklet for proper and intended use. Otherwise, contact

supplier for specific applications.

Section 8. Exposure Controls, Personal Protection

Engineering Controls Use process enclosures, local exhaust ventilation, or other engineering controls to keep

airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airbome contaminants below the

exposure limit.

Personal Protection

Eyes Splash goggles.

Body Lab coat.

Hands Gloves.

Respiratory Respirator is not needed under normal and intended conditions of use, if exposures are

kept below established limits.

Protective Clothing (Pictograms)

Section 9. Physical and chemical properties

Odor Sulfurous. (Strong.)

Molecular weight 154.25 g/mole Molecular formula C4H1002S2

Taste Not available.

Solubility Easily soluble in cold water, hot water, diethyl ether, acetone.

Section 10. Stability and reactivity

Stability and Reactivity



The product is stable.

Conditions to avoid Not available.

Materials to avoid Reactive with oxidizing agents, reducing agents, metals, alkalis, moisture.

Hazardous Will not occur.

polymerization

Hazardous Not available.

Decomposition Products

Section 11. Toxicological information

Toxicity to Animals Dithiothreitol (DTT): ORAL (LD50): Acute: 400 mg/kg [Rat].

Chronic Effects on CARCINOGENIC EFFECTS: Classified None. by OSHA, None. by NIOSH.

Humans MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for bacteria and/or

yeast. Causes damage to the following organs: mucous membranes, upper respiratory

tract, skin, eyes, central nervous system (CNS).

Other Toxic Effects on Hazardous in case of eye contact (irritant), of inhalation (lung irritant).

Humans

Special Remarks on Not available.

Toxicity to Animals

Special Remarks on Can cause CNS depression. Can cause gastrointestinal disturbances. Laboratory

Chronic Effects on experiments have shown mutagenic effects.

Humans

Special Remarks on Exposure can cause nausea, headache and vomiting. Material is irritating to mucous

Other Toxic Effects on membranes and upper respiratory tract.

Humans

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Reproductive toxicity No known significant effects or critical hazards.

Over-exposuresigns/symptoms

Inhalation No known significant effects or critical hazards. Ingestion No known significant effects or

critical hazards.

Skin No known significant effects or critical hazards.

Target organs Causes damage to the following organs: mucous membranes, upper respiratory tract,

skin, eyes, central nervous system (CNS).

Section 12. Ecological information

Mobility Not available.

Persistence/degradabilit Not available.

ν

Bioaccumulative Not available.

potential

Ecotoxicity Not available.

Section 13. Disposal considerations

Waste Stream Not available.

Methods of disposal The generation of waste should be avoided or minimized wherever possible. Avoid

dispersal of spilled material and runoff and contact with soil, waterways, drains and

sewers. Disposal of this product, solutions and any by-products should at all times



comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

European waste

catalogue (EWC)

Not available.

Hazardous waste The classification of the product may meet the criteria for a hazardous waste

Section 14. Transport information

Contact the supplier for all information regarding the proper transportation method for this material.

Section 15. Regulatory information

Label Requirements

(Europe) Harmful if swallowed. R36/37/38-Irritating to eyes, respiratory system and skin.

HCS Classification

Irritating material Target organ effects

U.S.Federal Regulations

TSCA 8(b) inventory: Dithiothreitol (DTT)

SARA 3021304/311/312 extremely hazardous substances: No products were found. SARA 3021304 emergency planning and notification: No products were found.

SARA 3021304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution -chemical inventory -hazard identification: No

products were found.

Clean Water Act (CWA) 307: No products were found. Clean Water Act (CWA) 311: No products were found.

Clean air act (CM) 112 accidental release prevention: No products were found. Clean air act (CM) 112 regulated flammable substances: No products were found. Clean air act (CM) 112 regulated toxic substances: No products were found.

State *regulations* No products were found.

WHMIS (Canada)

Class D-1B: Material causing immediate and serious toxic effects (TOXIC).

Class D-2B: Material causing other toxic effects (TOXIC).

CEPA DSL: Dithiothreitol (DTT)

International Regulations

EINECS Not available.

R22 Harmful if swallowed. DSCL (EEC)

R 36/37/38-Irritating to eyes, respiratory system and skin.

Section 16. Other information





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References Not available.

Intended Use Refer to the instruction booklet for proper and intended use. Otherwise, contact

supplier for specific applications.

Section 1. Chemical Product and Company Identification

Product Name N-Ethylmaleimide (NEM)

Product no. 52109

Supplie**r** Manufacturer

Columbia Biosciences Pierce

6440-D Dobbin Road 3747 N. Meridian Road

Columbia MD 21045 P.O. Box 117
Tel: (443) 430-0403 Rockford, IL 61105
Fax: (443) 430-0407 815.968.0747 or 1.800.874.3723

(815)968-7316 fax www.thermo.com

In case of *emergency* CHEMTREC:

800.424.9300 OUTSIDE US: 703.527.3887

Section 2. Composition, Information on Ingredients

Substance/preparation Ingredient name N-Ethylmaleimide (NEM)

CAS number 128-53-0 EC number 204-892-4

Classification T+; R28, Xn; R21, C; R34, R43

Section 3. Hazards Identification

United States Review the most current and approved institutional guideline, protocol, standard

operating procedure(s) and MSDS(s) for the proper handling of institutional materials/

equipment with use of this product.

Emergency Overview Danger!

MAY BE FATAL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED.

CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS.

CAN CAUSE HERITABLE GENETIC EFFECTS.

FLAMMABLE SOLID.

CAUSES DAMAGE TO THE FOLLOWING ORGANS: MUCOUS MEMBRANES, RESPIRATORY

TRACT, SKIN, EYES.

Do not ingest. Do not get in eyes, on skin or clothing. Do not brathe dust. Keep away

from heat, sparks, and flame. Keep container closed. Use only with adequate

ventilation. Wash thoroughly after handling.

Target organs Causes damage to the following organs: mucous membranes, upper respiratory tract,

skin, eyes.

Routes of Entry Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eyes Corrosive to eyes.



Skin Very toxic in contact with skin. Corrosive to the sin.

Inhalation Very toxic by inhalation. Corrosive to respiratory system.

Ingestion Very toxic if swallowed. May cause burns to mouth, throat and stomach.

Potential chronic health effects

Carcinogenic Effects CARCINOGENIC EFFECTS: Classified None. by NIOSH.

Data MUTAGENIC EFFECTS: Classified PROVEN for human.

TERATOGENIC EFFECTS: Not available.

Medical Conditions Repeated exposure of the eyes to a low level of dust can produce eye irritation.

Aggravated by Overexposure: Repeated skin exposure can produce: local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Overexposure

Overexposure

Repeated exposure to a highly toxic material may produce general deterioration of

/SignsiSymptoms health by an accumulation in one or many human organs. Not available.

Europe

Classification T+; R28

Xn;R21 C; R34 R43

Physical/chemical

hazards Not applicable.

Human health hazards Harmful in contact with skin.

Very toxic if swallowed.

Causes burns.

May cause sensitization by skin contact.

Environmental hazards Not applicable.

Section 4. First Aid Measures

Notice to Reader Get immediate medical attention.

Effects and symptoms

Inhalation Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract,

characterized by burning, sneezing and coughing. Over-exposure by inhalation may

cause respiratory irritation.

Ingestion May be fatal if swallowed. May cause burns to mouth, throat and stomach.

Skin Contact Hazardous in case of skin contact (sensitizer). Corrosive. The amount of tissue damage

depends on length of contact. Skin contact can produce inflammation and blistering.

Eye Contact Corrosive to eyes. Eye contact can result in corneal damage or blindness.

Aggravating conditions Repeated exposure of the eyes to a low level of dust can produce eye irritation.

Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated exposure to a highly toxic material may produce general deterioration of

health by an accumulation in one or many human organs.

First-Aid Measures

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.

Get medical attention immediately.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. Never give

anything by mouth to an unconscious person. Get medical attention immediately.



Skin Contact In case of contact, immediately flush skin with plenty of

water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention

immediately.

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eye Contact

Get medical attention immediately.

Notes to Physician Not available. Protection of first-aiders Not available.

Section 5. Fire Fighting Measures

Flammability of the May be combustible at high temperature.

Product

Flash Points Closed cup: 73°C (163.4°F).

Fire Hazards in Presence Not available.

of Various Substances

Fire Fighting Media and Use an extinguishing agent suitable for surrounding fires.

Instructions Not available.

Protective Clothing Be sure to use an approved/certified respirator or equivalent.

(Fire)

Hazardous thermal These products are carbon oxides (CO, nitrogen oxides (NO, ...).

(de)composition products

<u>Section 6. Accidental Release Measures</u>

Splash goggles. Synthetic apron. Dust respirator. Be sure to use .an approved/certified

Personal precautions respirator or equivalent. Gloves.

Environmental Stop leak if without risk. Do not get water inside container. Do not touch spilled Precautions and Clean- material. Use water spray to reduce vapors. Prevent entry into sewers, basements or

confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on up Methods

disposal.

Small Spill and Leak Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Section 7. Handling and Storage

Handling Do not ingest. Do not get in eyes, on skin or on clothing. Keep container closed. Use only

with adequate ventilation. Do not breathe dust. Wash thoroughly after handling.

Storage Keep container tightly closed. Keep container in a cool, well-ventilated area.

Intended Use Refer to the instruction booklet for proper and intended use. Otherwise, contact

supplier for specific applications.

Packaging materials

Suitable / Not suitable Use original container.

Czech Republic -Storage III

code

Section 8. Exposure Controls/Personal Protection

Engineering Controls Use process enclosures, local exhaust ventilation, or other engineering controls to keep

airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airbome contaminants below the

exposure limit.



Personal Protection

Eyes Splash goggles.
Body Lab coat.
Hands Gloves.

Respiratory Respirator is not needed under normal and intended conditions of use, if exposures are

kept below established limits.

Protective Clothing

Section 9. Physical and Chemical Properties

Odor Odorless.

Taste Not available.

Molecular Weight 125.14 g/mole

Molecular Formula C6H7NO2

Dispersion Properties See solubility in water.

Solubility Partially soluble in cold water, hot water.

Section 10. Stability and Reactivity

Stability and Reactivity The product is stable.

Conditions to avoid Not available.

Materials to avoid Reactive with oxidizing agents, acids, alkalis.

Hazardous

Polymerization Will not occur.

Hazardous

Decomposition Products Not available.

Section 11. Toxicological Information

Toxicity to Animals MALEIC ACID N-ETHYLIMIDE:

ORAL (LD50): Acute: 25 mg/kg [Rat]. 25 mg/kg [Mouse].

DERMAL (LD50): Acute: 500 mg/kg [Guinea pig].

Chronic Effects on CARCINOGENIC EFFECTS: Classified None. by NIOSH.

Humans MUTAGENIC EFFECTS: Classified PROVEN for human.

Causes damage to the following organs: mucous membranes, upper respiratory tract,

skin, eyes.

Other Toxic Effects on Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Humans

Special Remarks on Not available.

Toxicity to Animals

Special Remarks on Not available.

Chronic Effects on

Humans

Special Remarks on Not available.

Other Toxic Effects on

Humans

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Reproductive toxicity No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation No known significant effects or critical hazards.

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Ingestion No known significant effects or critical hazards.

Skin No known significant effects or critical hazards.

Target organs Causes damage to the following organs: mucous membranes, upper respiratory tract,

skin, eyes.

Section 12. Ecological Information

Mobility Not available. Persistence/ Not available.

degradability

Bioaccumulative Not available.

potential

Ecotoxicity Not available.

Mobility Not available.

Other adverse effects No known significant effects or critical hazards.

Section 13. Disposal Considerations

Waste Stream Not available.

Methods of disposal The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

European waste Not available.

catalogue (EWC)

Hazardous waste The classification of the product may meet the criteria for a hazardous waste

Section 14. Transport Information

Contact the supplier for all information regarding the proper transportation method for this material.

Section 15. Regulatory Information

Label Requirements (Europe)

R28-Very toxic if swallowed. R21-Harmful in contact with skin. R34-Causes burns. R43-May cause sensitization by skin contact. S26-In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28 After contact with skin, wash immediately with plenty of [***]. S36/37/39-Wear suitable protective clothing, gloves and eye/face protection. S45-In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HCS Classification

Highly toxic material Corrosive material Target organ effects

U.S.Federal Regulations

TSCA 8(b) inventory: MALEIC ACID N-ETHYLIMIDE

SARA 3021304/311/312 extremely hazardous substances: No products were found. SARA 3021304 emergency planning and notification: No products were found. SARA 3021304/311/312 hazardous chemicals: MALEIC ACID N-ETHYLIMIDE.

SARA 311/312 MSDS distribution -chemical inventory -hazard identification: MALEIC

ACID N-ETHYLIMIDE: Fire hazard, Delayed (Chronic) Health Hazard.

Clean Water Act (CWA) 307: No products were found. Clean Water Act (CWA) 311: No products were found.

Clean air act (CM) 112 accidental release prevention: No products were found.



Clean air act (CM) 112 regulated flammable substances: No products were found. Clean air act (CM) 112 regulated toxic substances: No products were found.

State *regulations* No products were found.

WHMIS (Canada) Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).

Class D-2B: Material causing other toxic effects (TOXIC).

CEPA DSL: MALEIC ACID N-ETHYLIMIDE

International Regulations

EINECS Not available.

DSCL (EEC) R28 - Very toxic if swallowed.

R21 - Harmful in contact with skin

R34 - May cause sensitization by skin contact

Section 16. Other information





References Not available.

Intended Use Refer to the instruction booklet for proper and intended use. Otherwise, contact

supplier for specific applications.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.