

NOSB NATIONAL LIST FILE CHECKLIST

CROPS

MATERIAL NAME: Sulfur

CATEGORY: Synthetic

Complete?: _____

NOSB Database Form

References

MSDS (or equivalent)

Date file mailed out: 1/17/95, 2/20/95

~~2/20/95~~

TAP Reviews from: _____

Joe Kovach

Paul Sachs

Walter Jeffery

Supplemental Information:

MISSING INFORMATION: _____

NOSB/NATIONAL LIST COMMENT FORM/BALLOT

Use this page to write down comments and questions regarding the data presented in the file of this National List material. Also record your planned opinion/vote to save time at the meeting on the National List.

Name of Material Sulfur

Type of Use: Crops; Livestock; Processing

TAP Review by:

1. Joe Kovach
2. Paul Sachs
3. Walter Jeffery

Comments/Questions:

My Opinion/Vote is:

Signature _____ Date _____

Rec'd 3-8-95

USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: due: 3/20/95

Name of Material: Sulfur

Reviewer Name: Walter Jeffers

Is this substance Natural or Synthetic? Explain (if appropriate)
a few years ago about 30% of the S produced in the US was Frasch (natural) and about 60% was recovered elemental S from petroleum or gas operations. So the product could be classified as both, but simplicity says call it synthetic.

Please comment on the accuracy of the information in the file:

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, This material does not belong on the National List because:

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

None that I can think of other than safety precautions.

Any additional comments or references?

The file is rather complete.

Signature Walter Jeffers Date 3/1/95

USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: Dec - March 20

Name of Material: Sulfur

Reviewer Name: Joe Korach

Is this substance Natural or Synthetic? Explain (if appropriate)

Natural

Please comment on the accuracy of the information in the file:

Info. is ~~actual~~ accurate w/ additions

This material should be added to the National List as:

Synthetic Allowed

Prohibited Natural

or, This material does not belong on the National List

because: It is one of the most toxic fungicides to beneficial ^{invertebrates} and even compared to most insecticides, it does not do that well. Sulfur is also responsible for the most acute illnesses of farm workers in CA. Given these two facts it does not conform ~~to~~ with an organic philosophy and should be prohibited from use on crops.

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

Any additional comments or references?

Signature Joe Korach Date 3/8/95

ORGANIC FOOD PRODUCTION ACT/NATIONAL LIST SECTIONS

USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: due: MAR 01 1995

Name of Material: Sulfur

Reviewer Name: Paul Sachs

Is this substance Natural or Synthetic? Explain (if appropriate)

Natural: The mining and refining process for sulfur is largely physical. Grinding and screening makes up the bulk of the processing.

Please comment on the accuracy of the information in the file:

I did not note any inaccuracies.

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, This material does not belong on the National List
because: *This product is naturally occurring and, if used according to the label, is relative innocuous in the environment. However, it is relatively broad spectrum and users should be aware that they may be affecting beneficial organisms as well.*

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

Only those described on the label.

Any additional comments or references?

Signature Paul D. Sachs Date 2/1/95

ORGANIC FOOD PRODUCTION ACT/NATIONAL LIST SECTIONS

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NOSB Materials Database

Identification

Common Name **Sulfur** **Chemical Name** Sulfur
Other Names elemental sulfur, sulfur flowers, Brimstone, Bensulfoids
Code #: CAS 7704-34-9 **Code #: Other** 30749
N. L. Category Synthetic Allowed

Chemistry

Composition S **Family** Inorganic
Properties Yellowish powder crystal. Mined and by-product sulfur have a similar level of impurities (very low).

How Made Sometimes naturally occurring but may be an industrial by-product which would be of "synthetic" origin.
3 Major Formulations: (1) Sulfur Dust: small particle mixed with 1-5% clay or talc. (2) Wettable Sulfur: finely ground sulfur and wetting agent to make sulfur soluble in water. (3) Colloidal Sulfur: particle size, formulated as a wet paste so it can be mixed.

Use/Action

Type of Use Crops
Use(s) fertilizer, pH balance
Fungicide: Powdery Mildew, Rusts, Scabs, Brown Rot, Rose Black Spot, Peach Leaf Curl, Pear Scab,
Insecticide: Anthropoids, Mites, Leprosis, Scab Mites.

Action Non-systemic fungicide with protective action. Secondary arcadial activity.

Combinations

Status

OFPA 2118(c)1(B)i

N. L. Restriction

EPA, FDA, etc 279-1721 ZB, Wettable Sulfur: 279-387AA

Registration

Directions

Safety Guidelines Keep away from heat or flame, Adequate Ventilation, Wear Protective Clothing when handling.

State Differences

Historical status Oldest effective pesticide. Registered since 1920 with the EPA. Allowed by certification groups.

International status OCIA: Restricted; EU & CODEX & IFOAM all allowed.

NOSB Materials Database

OFPA Criteria

- 2119(m)1:chem. inter.** -Sulfur and Oils should not be used within a month of one another.
-Slight oxidation to the volatile oxide
-Incompatibility: Strong oxidizing agents, most common metals and hydrogen.
-Copper and Oils cause sulfur to be more potent but could cause burn on plant tissue.
- 2119(m)2: toxicity** -Shown to be practically non toxic to bobwhite, quail, (2) fish species, daphnia, Mysid shrimp and honey bees. Moderately toxic to beneficial arthropods (Theiling 1987).
-Decomposition: Oxides of sulfur.
- 2119(m)3:manufacture** Sulfur mining may cause environmental problems. By-product sulfur has a positive impact on environment in that gas which would otherwise be released into the atmosphere is being collected and recycled into an agricultural input.
- 2119(m)4:humans** -Low toxicity
-Precautions should be taken to prevent inhalation which can damage lungs.
-Strong irritant to skin and eyes; wear protective clothing.
Caused most reported acute illnesses associated with agricultural exposures in California between 1984- 1990. (Pease et al., 1993).
- 2119(m)5: biology** -Add sulfur to adjust pH, but overuse can weaken or kill plants.
-Phytotoxicity to cucurbits, apricots, raspberries and certain other sulfur 'shy' plants.
-Microbial degradation in or on plants.
-Can have REVERSE effects on beneficial insects
- 2119(m)6:alternatives** -Lindane: for scabies, mites, crotamiton and permethrin
-Rotenone and Pyrethrin for organic garden dusts
- Good disease preventitive practices such as open center pruning to enhance air circulation and light exposure, sanitation, good irrigation practices.
- 2119(m)7:compatible**

References

1. Olkowski, W, S. Daar, H. Olkowski. 1991. Common Sense Pest Control. Conneticut. Tauton Press. pg 109.
2. Chemical Free Yard and Garden 1991.Emmus, PA. Rodale Press. pgs. 80& 222.
3. Theiling, K.M. 1987. The SELCTV database: The susceptibilit of arthropod natural enemies of agricultural pests to pesticides. MS Thesis. Oregon State University, Corvallis 170pp.
4. Pease, W.S., R.A. Morella-Frash, D.S. Albright, A.O. Kyle, and J.C. Robinson. 1993. Preventing pesticide related illness in California Agriculture. An Environmental Heathh Policy Program Report. School of Public Health, U.C. Berkeley.
5. Monterey Chemical Co: P.O. Box 5317 Fresno, Ca. 209-225-4770
6. FMC Co: 2000 Market St. Philadelphia, PA 716-735-3765

& see attached.

SULFUR REFERENCES

AU: Khamraev,-A.Sh.; Zakhidov,-M.M.; Iuldashev,-A.

TI: Water-wettable sulfur.

SO: Zashch-Rast. Moskva : "Agropromizdat". 1986. (7) p. 43-44.

CN: DNAL 421-Z1

AU: Lyle,-E.-W. (Eldon W.), 1908-

TI: Control of black spot of roses with sulphur-copper dust.

SO: College Station, Tex. : Texas Agricultural Experiment Station, 1944. 27 p. : ill.

CN: DNAL 100-T31S-1-no.648

AU: Cullinan,-F.-P. (Frank Patrick), 1895-; Baker,-Clarence-E. (Clarence Everett), 1896-

TI: Liquid lime sulphur versus sulphur dust for apple spraying.

SO: Lafayette, Ind. : Purdue University Agricultural Experiment Station, 1924. 22 p. : ill.

CN: DNAL 100-In2P-no.283

AU: Maynard,-D.G.; Addison,-P.A.; Kennedy,-K.A.

TI: Impact of elemental sulphur dust deposition on soils and vegetation of Pinus contorta stands in west-central Alberta, Canada [Environment pollution, vegetation injuries].

SO: Aquilo-Ser-Bot. Oulu, Finland : Oulun Luonnonystävain Yhdistys. 1983. v. 19 v. II p. 314-325.

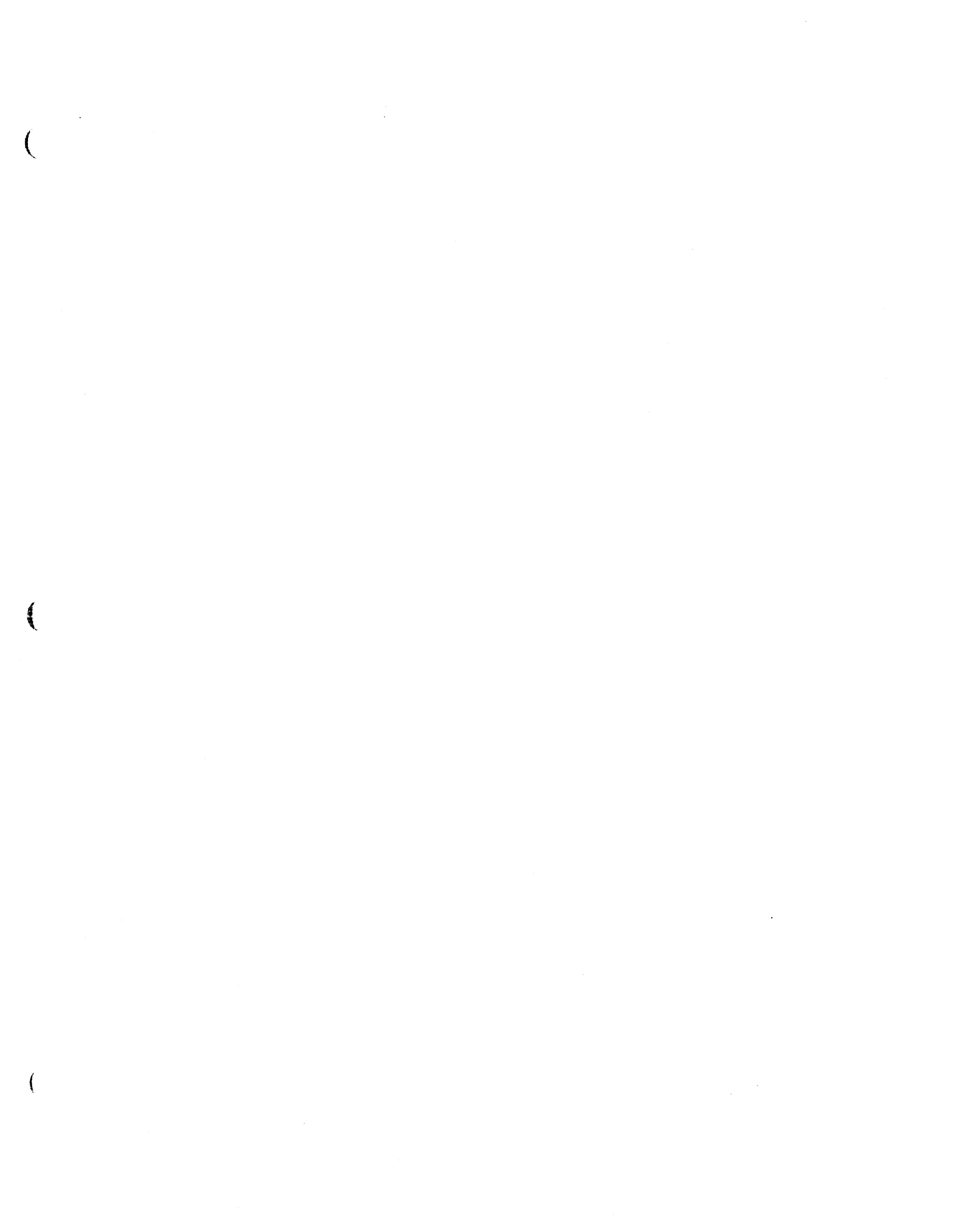
CN: DNAL QK1.A6

AU: Kundert,-J

TI: Powdery mildew control in apples with sulfur dust

SO: Schweiz-Z-Obst--Weinbau, Jan 9, 1971, 107 (1): 19-21.

CN: DNAL 80-SCH9



MSDS for SULFUR

Page 1

1 - PRODUCT IDENTIFICATION

PRODUCT NAME: SULFUR
FORMULA: S
FORMULA WT: 32.06
CAS NO.: 7704-34-9
NIOSH/RTECS NO.: WS4250000
COMMON SYNONYMS: BRIMSTONE; BENSULFOID; FLOWERS OF SULFUR; PRECIPITATED
SULFUR; SUBLIMED SULFUR
PRODUCT CODES: 4084,4088
EFFECTIVE: 06/09/86
REVISION #01

PRECAUTIONARY LABELLING
BAKER SAF-T-DATA(TM) SYSTEM

HEALTH - 1 SLIGHT
FLAMMABILITY - 1 SLIGHT
REACTIVITY - 0 NONE
CONTACT - 1 SLIGHT

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT: SAFETY GLASSES; LAB COAT

PRECAUTIONARY LABEL STATEMENTS

WARNING

DUST MAY FORM FLAMMABLE OR EXPLOSIVE MIXTURE WITH AIR.
KEEP AWAY FROM HEAT, SPARKS, FLAME.
DURING USE AVOID CONTACT WITH EYES, SKIN, CLOTHING. WASH THOROUGHLY AFTER
HANDLING. WHEN NOT IN USE KEEP IN TIGHTLY CLOSED CONTAINER.

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
SULFUR		7704-34-9

3 - PHYSICAL DATA

BOILING POINT: 445 C (833 F) VAPOR PRESSURE(MM HG): N/A
MELTING POINT: 116 C (241 F) VAPOR DENSITY(AIR=1): 8.8
SPECIFIC GRAVITY: 2.01 EVAPORATION RATE: N/A
(H2O=1) (BUTYL ACETATE=1)

SOLUBILITY(H2O): NEGLIGIBLE (LESS THAN 0.1 %) % VOLATILES BY VOLUME: 0
APPEARANCE & ODOR: ODORLESS, YELLOW POWDER, CRYSTALS OR SOLIDS.

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP 188 C (370 F) NFPA 704M RATING: 1-1-0

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA

USE WATER SPRAY, ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE.

SPECIAL FIRE-FIGHTING PROCEDURES

FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.

UNUSUAL FIRE & EXPLOSION HAZARDS

WHEN HEATED TO DECOMPOSITION, TOXIC FUMES OF SULFUR DIOXIDES ARE EMITTED.

TOXIC GASES PRODUCED: SULFUR DIOXIDE

5 - HEALTH HAZARD DATA

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE

NO EFFECTS OF OVEREXPOSURE WERE DOCUMENTED.

TARGET ORGANS

NONE IDENTIFIED

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

NONE IDENTIFIED

ROUTES OF ENTRY

NONE INDICATED

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: IF SWALLOWED AND THE PERSON IS CONSCIOUS, IMMEDIATELY GIVE LARGE AMOUNTS OF WATER. GET MEDICAL ATTENTION.

INHALATION: IF A PERSON BREATHES IN LARGE AMOUNTS, MOVE THE EXPOSED PERSON TO FRESH AIR. GET MEDICAL ATTENTION.

EYE CONTACT: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.

SKIN CONTACT: IMMEDIATELY WASH WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES.

6 - REACTIVITY DATA

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: AID HEAT, FLAME, OTHER SOURCES OF IGNITION

INCOMPATIBLES: STRONG OXIDIZING AGENTS, MOST COMMON METALS, HYDROGEN,

INHALATION: CHLORINE, FLUORINE,

ORGANIC MATERIALS AT ELEVATED TEMPERATURES

EYE CONTACT:

DECOMPOSITION PRODUCTS: OXIDES OF SULFUR

SKIN CONTACT:

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE

WEAR SUITABLE PROTECTIVE CLOTHING. CAREFULLY SWEEP UP AND REMOVE.

DISPOSAL PROCEDURE

DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL-----
ENVIRONMENTAL REGULATIONS.

8 - PROTECTIVE EQUIPMENT

VENTILATION:S: USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATIONEN,
INHALATION: TO KEEP FUME OR DUST VELS AS LOW AS POSSIBLE.
ORGANIC MATERIALS AT ELEVATED TEMPERATURES
RESPIRATORY PROTECTION NONE REQUIRED WHERE ADEQUATE VENTILATION
DECOMPOSITION PRODUCTS: CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS
HIGH, USE AN APPROPRIATE RESPIRATOR OR DUST MASK.
EYE/SKIN PROTECTION: SAFETY GLASSES WITH SIDESHIELDS, PROPER GLOVES ARE
RECOMMENDED.

9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)
SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE
AREA.

10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)DUCTS:

PROPER SHIPPING NAME SULFUR, SOLID (WATER ONLY)
HAZARD CLASS ORM-C
UN/NA UN1350
LABELS NONE

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME SULPHUR, POWDER
HAZARD CLASS 4.1
UN/NA----- UN1350-----
LABELS FLAMMABLE SOLID

HAZARD CLASS ORM-C

