NOSB NATIONAL LIST FILE CHECKLIST

PROCESSING

MATERIAL NAME: Sodium carbonates
CATEGORY: Non-agricultural

Complete?: 3/17

/ NOSB Database Form
/ References
/ MSDS (or equivalent)
/ FASP (FDA)

Date file mailed out: 1/8/95

TAP Reviews from: Bob Durst
                    Steve Taylor
                    Richard Thavoe

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: Sodium carbonate

Type of Use: ___ Crops; ___ Livestock; ___ Processing

TAP Review by:
1. Steve Taylor
2. Richard Theuer
3. Bob Ouest

Comments/Questions:

My Opinion/Vote is:

Signature ___________________________ Date ___________________
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: Jan 7

Name of Material: Sodium Carbonate
Reviewer Name: Steve Taylor

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

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

This material should be added to the National List as:

X 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?

Made from Sodium bicarbonate and ammonia

Any additional comments or references?

Signature Steve Taylor Date 3-5-95
Material: Sodium carbonate

Reviewer: Bob Durst

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

Please comment on the accuracy of the information in the file:
  The file is accurate.

This material should be added to the National List as:
  __X__ Synthetic Allowed,
  ___ Prohibited Natural, or
  ___ This material does not belong on the National List because:

Are there any restriction or limitations that should be placed on this material by use or application on the National List?
  Must be listed on the ingredient label.

Any additional comments or references?
  As with all synthetic inorganic salts, source must be food grade. In addition each lot should be analyzed for toxic element concentrations (mercury, lead, cadmium, arsenic, thallium and antimony) and a near zero tolerance adopted.

Signature: ________________________________  Date: __3/11/85__
Name of Material: Sodium Carbonate and Sodium Bicarbonate
Reviewer Name: Richard C. Theuer

NATURAL
Sodium carbonate and sodium bicarbonate produced in North America are made primarily from natural deposits of trona ore (90% sodium sesquicarbonate). In California, sodium carbonate and sodium bicarbonate are produced by generally similar methods from natural brine (Searles Lake). Trona ore is heated at temperatures (160-200°C, or 320-390°F) achievable in the home kitchen. The calcined ore, which is impure soda ash (sodium carbonate), is mixed with water to dissolve the soda ash and to separate it from insoluble impurities. This solution is concentrated by evaporation and sodium carbonate monohydrate crystals are separated. Sodium bicarbonate is prepared by adding the carbon dioxide in the kiln gas to a saturated pure sodium carbonate solution. The sodium bicarbonate formed is less soluble than the sodium carbonate and it precipitates out of the solution.

Other parts of the world may use the old Solvay process to produce synthetic sodium carbonates. The Solvay process uses salt (sodium chloride) and limestone (calcium carbonate) to produce soda ash (sodium carbonate) and calcium chloride. The only major use for calcium chloride was to keep dirt roads less dusty in the summer (calcium chloride is very deliquescent) and to de-ice city streets and highways in the winter (it replaces road salt and adds calcium instead of sodium to the runoff).

COMMENTS RE SECTION 2119(m) CRITERIA:
1. Compared to the original Solvay process for sodium carbonate production, trona ore extraction has the advantage of being natural and less environmentally damaging. Generally, food usage of sodium carbonates is limited. Waste water facilities generally can balance off alkaline waste water with the more common acidic wastes.
2. Sodium carbonates are corrosive caustics; cautious use and protection is required during use. Sodium is an essential nutrient for man and other animals. Current food labeling regulations require sodium labeling on all foods, so usage is controlled by manufacturers.
3. Sodium carbonate is essential for the characteristic color of pretzels. Potassium carbonate, bicarbonate and/or hydroxide can replace some pH adjusting roles of sodium carbonates, but these are less environmentally good, are more expensive and contribute a different and more bitter nutrient to the food.
4. Production of sodium carbonates from an ore which is 90% sodium carbonates is more sustainable than other methods.

The following natural substances should be allowed as ingredients in organic foods. They should not be added to the National List of natural substances prohibited for use as ingredients or processing aids in Organic Food:

sodium carbonate, sodium bicarbonate.
**NOSB Materials Database**

**Identification**

**Common Name**  
Sodium carbonates

**Other Names**  
Soda Ash, Bicarbonate of Soda, Baking Soda

**Code #: CAS**

**Non-agricultural**

**Chemical Name**

**Code #: Other**

**MSDS**  
Ø yes  ○ no

**Chemistry**

**Composition**

$\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$

**Properties**

Colorless crystals or white, granular or crystalline powder. Soluble in water, and solutions are alkaline. May be anhydrous or may contain 1 or 10 molecules of water of hydration.

In the US the main source is natural deposits of trona ore. Also can be from natural brine (In Searles Lake in California). Trona ore (sodium sesquicarbonate) is heated and then mixed with water to dissolve the soda ash and to separate out insoluble impurities. Then concentrated by evaporation to crystallization.

Sodium bicarbonate (baking soda) is prepared by adding the carbon dioxide in the kiln gas to a saturated pure sodium carbonate solution. The bicarbonate formed precipitates out of the solution.

The older method is the Solvay process from sodium bicarbonate and ammonia, or by reaction of sodium chloride and calcium carbonate with ammonia.

**How Made**

**Processing**

**Type of Use**

**Specific Use(s)**

Alkali. Neutralizer for dairy products; in olives before canning; and in cocoa products. Baking Soda is used as a leavening agent in pancakes, biscuits, and muffins; in baking powder, in crackers and cookies and in self-rising flours.

**Use/Action**

**Status**

**OFPA**

**N. L. Restriction**

**EPA, FDA, etc**

FDA-GRAS

**Directions**

Caustic and corrosive. Use appropriate protection during use.

**Safety Guidelines**

**State Differences**

**Historical status**

**International status**

Allowed by IFOAM, EU, and Codex.
NOSB Materials Database

OFPA Criteria

2119(m)1: chemical interactions  Not Applicable
2119(m)2: toxicity & persistence  Not Applicable
2119(m)3: manufacture & disposal consequences
   Alkaline waste water generated from this use can be balanced out by acidic wastes.

2119(m)4: effect on human health
   Irritating to lungs and eyes.

2119(m)5: agroecosystem biology  Not Applicable
2119(m)6: alternatives to substance
   Other alkalis, such as potassium carbonate.

2119(m)7: Is it compatible?

References

AU: Trenholm,-H.L.; Charmley,-L.L.; Prelusky,-D.B.; Warner,-R.M.
TI: Washing procedures using water or sodium carbonate solutions for the decontamination of three cereals contaminated with deoxynivalenol and zearalenone.
CN: DNAL 381-J6223
AB: Washing techniques for decontaminating deoxynivalenol (DON)- and zearalenone (ZEN)-contaminated grains were developed. Using 1 M sodium carbonate solution for the first wash reduced DON by 72-74% and ZEN by 80-87%. Soaking barley, corn, and wheat in a 0.1 M sodium carbonate solution for 24 or 72 h caused a 42-100% reduction in toxin concentration.

AU: Whitehead,-W.E.; Ayres,-J.W.; Sandine,-W.E.
TI: A review of starter media for cheese making.
CN: DNAL 44.8-J822
AB: In the early days of the dairy industry, raw milk was used to grow starters for cheese making. To improve cheese quality, the raw milk eventually was replaced by selected producer's milk, NDM. Performance examples of available starter media for both mesophilic and thermophilic starters are discussed.

TI: Flotation materials for pears.
CN: DNAL TP440.P67

Boyd Foster, written communication, 1994. Arrowhead Mills, TX
MATERIAL SAFETY DATA SHEET
SODIUM CARBONATE

SECTION I - Product Identification

PRODUCT NAME: SODIUM CARBONATE
FORMULA: N/A
FORMULA WT: N/A
COMMON SYNONYMS: N/A

SECTION II - Hazardous Components

SODIUM CARBONATE

SECTION III - Physical Data

BOILING POINT: DECOMPOSES
VAPOUR PRESSURE (MM HG): N/A
MELTING POINT: N/A
VAPOUR DENSITY (AIR=1): NA
SPECIFIC GRAVITY: N/A
(NA/MO=1)
EVAPORATION RATE: NA
SOLUBILITY (H2O): N/A
% VOLATILES BY VOLUME: NIL
APPEARANCE & ODOR: WHITE GRANULAR SOLID/ODORLESS

SECTION IV - Fire and Explosion Hazard Data

FLAMMABILITY CLASSIFICATION: UNK
FLASH POINT: NON
FLAMMABLE LIMITS: UPPER - NA % LOWER - NA %
FIRE EXTINGUISHING MEDIA: ALL
SPECIAL FIRE-FIGHTING PROCEDURES: NONE
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION V - Health Hazard Data

EFFECTS OF OVEREXPOSURE:
SKIN/MUCOUS MEMB/RESP TRACT IRR/EYE/SEVERE IRR-CORNEAL OPACITIES
MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE:
MAY CAUSE INFLAMM OF MUCOUS MEMB IN RESP TRACT AND OF SKIN
PRIMARY ROUTE(S) OF ENTRY: EYE/SKIN/INGEST/INHALE
EMERGENCY AND FIRST AID PROCEDURES:
EYE/WASH UND LIDS W/LOTS H2O 15 MIN-SEE DR;SKIN/WASH W/LOTS H2O 15 MIN-SEE DR
INGEST/H2O TO DILUTE-CALL DR;INHALE/FRESH AIR-CALL DR IF NEC

SECTION VI - Reactivity Data

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
CONDITIONS TO AVOID: CONTACT W/ACIDS EXCEPT UNDER CONTROLLED CONDITIONS
INCOMPATIBILITIES: REACTS W/ACIDS W/RELEASE OF LG VOLUMES OF CARBON
DIOXIDE GAS AND HEAT
DECOMPOSITION PRODUCTS: NONE

SECTION VII - Spill and Disposal Procedures

DISPOSAL PROCEDURE:
MTS IN SECURE CHEM LANDFILL BY REGS;EMPTY CONTAINERS INCINER OR GEN TRASH
OTHER PRECAUTIONS: NONE

SECTION VIII - Protective Equipment

VENTILATION:
GENERAL ROOM DILUTION OR LOCAL EXHAUST IF EXCESS DUST MAY BE RELEASED
RESPIRATORY PROTECTION: DUST RESP IF TLV 10MG/CUBIC METER EXCEEDED
EYE PROTECTION: CHEMICAL GOGGLES
SKIN PROTECTION: GENERAL PURPOSE
OTHER EQUIPMENT: FULL COVER CLOTHING
HYGIENIC PRACTICES: WASH W/SOAP AND WATER

SECTION IX - Storage and Handling Precautions

SPECIAL PRECAUTIONS:
AWAY FROM ACIDS; MINIMIZE FREE FALL TO MINIMIZE DUST GENERATED

SECTION X - Transportation Data and Additional Information

N/A

(TM) and (R): Registered Trademarks
N/A = Not Applicable OR Not Available
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U.S. FOOD AND DRUG ADMINISTRATION
FOOD ADDITIVE SAFETY PROFILE

SODIUM CARBONATE

#1: 005968116
SHP: 2733
SEP: ASP
#1: 0185
JECFA: NL-C
JECFA ADI:
JECFA ESTABLISHED: 1965
LAST UPDATE: 931115

105.99
DENSITY: LOGP:

CATEGORY CATEGORIES: A7

COMPONENTS:

SYNTHESIS:
DISODIUM CARBONATE MONOHYDRATE
CARBONIC ACID DISODIUM SALT, MONOHYDRATE

CHEMICAL FUNCTION: D

TECHNICAL FUNCTION:
PH CONTROL AGENT
PROCESSING AID
LEAVENING AGENT
ANTIOXIDANT
CURING OR PICKLING AGENT
FLAVORING AGENT OR ADJUVANT

REG NUMBERS: 173.310 184.1742 163.110

IMMUT TESTING LEVEL: 3

COMMENTS: NO TOX STUDIES IN SCOGS:26

(?) ACUTE TOXICITY INFORMATION

LD50: 5
SPECIES: RAT
YEAR: 1973
LD50: 2450 MG/KG BW

COMMENTS:

LD50: 4
SOURCE: GRM 000011 8:1366

SOURCE: GRM 000011 8:1368
9: ORAL TOXICITY STUDIES (OTHER THAN ACUTE)

Y: 3
COMPLETENESS: B

SOURCES:
GRM 000011 8:1418

IES: RABBIT

TERATOLOGY (GAVAGE)

YEAR: 1974

LEL: > MG/KG BW/DAY
HNEL: 179 MG/KG BW/DAY

COMMENTS: NO EFFECTS