

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

**National Institute of Standards and Technology
Standard Reference Materials Program
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**SRM Number: 1400
MSDS Number: 1400
SRM Name: Bone Ash**

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Description: This Standard Reference Material (SRM) is intended primarily for use in evaluating analytical methods for the determination of selected major, minor, and trace elements in bone and in material of a similar matrix. It consists of bone ash that was blended to a high degree of homogeneity. Each unit of this material consists of 50 g.

Substance: Bone Ash.

Other Designations: Hydroxyapatite; hydroxylapatite; calcium hydroxyl apatite; tricalcium phosphate; tricalcium orthophosphate; tertiary calcium phosphate; calcium phosphate tribasic.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component:	Bone Ash
CAS Number:	1306-06-5
EC Number (EINECS):	215-145-7
Nominal Mass Fraction (%):	100
EC Classification:	Xi (Irritant); not classified in Annex I of Directive 67/548/EEC
EC Risk:	R22 (harmful if swallowed) R36/37/38 (irritating to eyes, respiratory system and skin)
EC Safety:	S23 (do not breathe fumes) S24/25 (avoid contact with skin and eyes) S45 (in case of accident or illness, see doctor; show label)

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: This material can irritate the respiratory tract, skin, eyes, and GI tract. Its toxicity is low, and normal occupational exposure is unlikely to cause significant adverse health effects.

Physical Hazards: None documented. The bottle may break or shatter.

Potential Health Effects:

- Inhalation:** Inhalation of this material may irritate the respiratory tract.
- Skin Contact:** Prolonged contact with this material may cause skin irritation.
- Eye Contact:** Contact with this material may cause severe eye irritation, with possible damage to the cornea.
- Ingestion:** Ingestion of a large dose (unlikely) might irritate the GI tract, causing symptoms such as abdominal pain, nausea, vomiting, and diarrhea.

Medical Conditions Aggravated by Exposure: The toxicity of this material is low at normal exposure levels, but it may aggravate conditions affecting the upper respiratory tract, skin, or eyes.

Listed as a Carcinogen/ Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u> X </u>
In the International Agency for Research on Cancer (IARC) Monographs	_____	<u> X </u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u> X </u>

4. FIRST AID MEASURES

Inhalation: Move the person to fresh air immediately. Qualified medical personnel may start CPR or give oxygen if necessary. Get medical aid at once, and bring the container or label.

Skin Contact: Remove contaminated clothing and shoes. Flush affected skin with water for at least 15 minutes, then wash thoroughly with soap and water. If skin irritation persists, get medical aid and bring the container or label. Wash contaminated clothing before reusing.

Eye Contact: Remove contact lenses (if any). Do not allow victim to rub eyes or keep eyes closed. Flush eyes with large amounts of running water for at least 30 minutes, keeping eyelids open and raising lids to remove all chemical. Get medical aid at once, and bring the container or label.

Ingestion: Contact a poison control center immediately for instructions. Wash out mouth with water, but do not induce vomiting. Get medical aid at once, and bring the container or label.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: This material is not combustible in air and does not present a significant fire hazard.

Extinguishing Media: Use extinguishing media appropriate to the surrounding fire, such as water spray, carbon dioxide, dry chemical, or foam.

Fire Fighting: Avoid inhalation of material or combustion byproducts. Wear protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): N/A

Autoignition (°C): N/A

Lower Explosive Limit (LEL): N/A

Upper Explosive Limit (UEL): N/A

Flammability Class (OSHA): N/A

Products of Combustion: Thermal decomposition of this material may produce carbon oxides.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Isolate the spill area. Cleanup personnel should wear personal protective equipment (Section 8). Sweep up material and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Provide ventilation.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store this material in the original container at room temperature. Protect from moisture, heat, and physical damage, and isolate from incompatible materials. Do not expose this material to sunlight or other sources of ultraviolet radiation.

Safe Handling Precautions: Wear safety goggles and a dust mask or respirator. Avoid contact or wash after handling. Gloves or a barrier cream may be used to protect the skin.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

ACGIH TLV-TWA: None established.

OSHA TLV-TWA: None established.

UK WEL: None established.

Ventilation: Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

Respirator: If necessary, refer to the NIOSH document *Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84* for selection and use of respirators certified by NIOSH.

Eye Protection: Use chemical safety goggles where dusting or splashing of solutions may occur. See OSHA standard (29 CFR 1910.133) or European Standard EN166. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

Personal Protection: Wear appropriate gloves and protective clothing to prevent contact with skin.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: Bone Ash

Appearance and Odor: Fine white powder, odorless

Relative Molecular Weight: 502.3

Molecular Formula: $\text{Ca}_5\text{HO}_{13}\text{P}_3$

Density (g/cm³): 3.1

Solvent Solubility: Soluble in acidic solutions.

Water Solubility: Practically insoluble

Boiling Point (°C): N/A (decomposes)

Melting Point (°C): Not applicable.

Critical Solution Temperature: N/A

10. STABILITY AND REACTIVITY

Stability: Stable Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Dust generation; UV exposure; contact with incompatible materials.

Incompatible Materials: Strong oxidizing agents.

Fire/Explosion Information: Not applicable.

Hazardous Decomposition: Thermal decomposition of this material may produce carbon oxides.

Hazardous Polymerization: Will Occur Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: Inhalation Skin Ingestion

Toxicity Data:

Rat, oral, LD₅₀, > 25 g/kg (practically nontoxic)

Target Organ(s): Skin, eyes, upper respiratory tract.

Mutagen/Teratogen: This material is not known to be a mutagen, teratogen, or other reproductive hazard.

Health Effects: See Section 3, "Hazards Identification".

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Not applicable.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of container and unused contents in accordance with federal, state, and local requirements.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302: Not regulated.

SARA Title III Section 304: Not regulated.

SARA Title III Section 313: Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	No
CHRONIC:	No
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not determined.

EUROPEAN REGULATIONS

EU/EC Classification: Not determined.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed

TSCA 12(b), Export Notification: Not listed

16. OTHER INFORMATION

Sources:

Hazardous Substances Data Bank (HSDB): *Hydroxyapatite*.

PAN Pesticide Database: *Calcium Phosphate, Tribasic*.

U.S. National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, September 2005 edition. DHHS (NIOSH) Publication No. 2005-151.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.