Safety Data Sheet

According to 29 CFR 1910.1200 (OSHA Hazard Communication Standard, 2024)

Version 2 · Date of preparation 2026-10-07

Section 1. Identification

Product identifier used on the label	HBTU (product number 31001)
Other means of identification	HBTU (P3 BioSystems product number 31001).
Recommended use of the chemical and restrictions on use	Laboratory chemical: peptide coupling reagent for research and for the manufacture of substances. Uses advised against: food, drug, pesticide, biocidal, household or cosmetic use.
Name, U.S. address, and U.S. telephone number of the chemical manufacturer, importer, or other responsible party	P3 BioSystems 270 Haven Hill Rd, Shelbyville, KY 40065 Telephone: +1 888-737-5598 Email: info@p3bio.com
Emergency phone number	+1 888-737-5598 (P3 BioSystems office line, business hours)

Section 2. Hazard identification

Classification of the chemical in accordance with paragraph (d)(1) of § 1910.1200, except for classification under paragraph (d)(1)(ii)	• Skin corrosion/irritation, category 2 • Eye damage/irritation, category 2A • Specific target organ toxicity (single exposure), category 3 • Sensitization - skin, category 1 (including both sub-categories 1A and 1B) (sub-category 1A)

Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of § 1910.1200	**Signal word: Warning** Hazard pictograms: Exclamation Mark Hazard statements: • H315 Causes skin irritation. • H319 Causes serious eye irritation. • H335 May cause respiratory irritation. • H317 May cause an allergic skin reaction. Precautionary statements: • P261 Avoid breathing dust. • P264 Wash hands, face and any exposed skin thoroughly after handling. • P271 Use only outdoors or in a well-ventilated area. • P272 Contaminated work clothing must not be allowed out of the workplace. • P280 Wear protective gloves/protective clothing/eye protection/face protection. • P302+P352 If on skin: Wash with plenty of soap and water. • P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing. • P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. • P312 Call a poison center or doctor if you feel unwell. • P321 Specific treatment (see first-aid measures, section 4 of the safety data sheet). • P333+P313 If skin irritation or rash occurs: Get medical advice/attention. • P337+P313 If eye irritation persists: Get medical advice/attention. • P362+P364 Take off contaminated clothing and wash it before reuse. • P403+P233 Store in a well-ventilated place. Keep container tightly closed. • P405 Store locked up. • P501 Dispose of contents/container to an approved waste disposal facility in accordance with local, state and federal regulations.
Hazards classified under paragraph (d)(1)(ii) of § 1910.1200	In its intended use as a peptide coupling reagent, the product reacts to release 1,1,3,3-tetramethylurea and 1-hydroxybenzotriazole (HOBt), with hexafluorophosphate salts. Dry HOBt is explosive. Refer to the safety data sheets for those substances when assessing reaction mixtures and waste.
Hazards not otherwise classified that have been identified during the classification process	None identified.
Where an ingredient with unknown acute toxicity is used in a mixture at a concentration ≥ 1% and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity	Not applicable: the product is a substance, not a mixture.

Section 3. Composition/information on ingredients

Chemical name	[dimethylamino-(3-oxidobenzotriazol-3-ium-1-yl)methylidene]-dimethylazanium hexafluorophosphate
Common name and synonyms	HBTU; O-(Benzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate; 2-(1H-Benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate; N,N,N',N'-Tetramethyl-O-(1H-benzotriazol-1-yl)uronium hexafluorophosphate.
CAS number and other unique identifiers	• CAS number: 94790-37-1 • InChIKey: BSKUEERROYGAFF-UHFFFAOYSA-N • PubChem CID: 51341376
Impurities and stabilizing additives (constituents) which are themselves classified and which contribute to the classification of the substance	None known. The product is a single substance (purity ≥ 99.0% by HPLC per specification); no impurities or stabilizing additives that are themselves classified are known to contribute to its classification.

Section 4. First-aid measures

Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion	Inhalation: Remove the person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Call a poison center or doctor if you feel unwell; get medical attention if breathing difficulty or other symptoms occur. Skin contact: Take off contaminated clothing. Wash the skin with plenty of soap and water for at least 15 minutes. If skin irritation or a rash occurs, get medical advice/attention. Wash contaminated clothing before reuse. Eye contact: Rinse immediately and cautiously with plenty of water for at least 15 minutes, also under the eyelids. Remove contact lenses, if present and easy to do, and continue rinsing. If eye irritation persists, get medical advice/attention. Ingestion: Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Skin: irritation; allergic skin reaction (redness, rash, itching), which may appear some time after contact. Eyes: serious eye irritation. Inhalation: irritation of the nose, throat and respiratory tract. In persons sensitized to HBTU, allergic reactions including rhinitis, asthma-like symptoms and anaphylaxis have been reported.
Indication of immediate medical attention and special treatment needed, if necessary	Treat symptomatically. Persons with allergic or asthma-like symptoms need prompt medical evaluation; anaphylaxis requires immediate emergency treatment. In a fire, exposure to hydrogen fluoride is possible; treat accordingly.

Section 5. Fire-fighting measures

Suitable (and unsuitable) extinguishing media	Suitable extinguishing media: water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam. Unsuitable extinguishing media: No information available.
Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products)	Not classified as flammable, but the material is combustible and fine dust may form combustible dust concentrations in air. Keep product and empty containers away from heat and sources of ignition. Hazardous combustion products: carbon monoxide, carbon dioxide, nitrogen oxides (NOx), phosphorus oxides and hydrogen fluoride.
Special protective equipment and precautions for fire-fighters	Wear a self-contained breathing apparatus (pressure-demand, NIOSH-approved or equivalent) and full protective gear. Cool unopened containers with water spray.

Section 6. Accidental release measures

Personal precautions, protective equipment, and emergency procedures	Wear the protective equipment described in section 8, including respiratory protection where dust is present. Avoid dust formation; do not breathe dust; avoid contact with skin and eyes. Ensure adequate ventilation. Evacuate unnecessary personnel.
Methods and materials for containment and cleaning up	Prevent the product from entering drains. Without creating dust, sweep up and shovel into a suitable, closed, labelled container for disposal (section 13). Clean the affected area afterwards.

Section 7. Handling and storage

Precautions for safe handling	Handle in a chemical fume hood or with local exhaust ventilation. Avoid formation of dust and aerosols and do not breathe dust. Avoid contact with skin, eyes and clothing. Keep away from sources of ignition. Do not take contaminated work clothing out of the workplace; wash it before reuse. Wash hands and face thoroughly after handling and before breaks. Do not eat, drink or smoke while handling.
Conditions for safe storage, including any incompatibilities	Keep the container tightly closed and store refrigerated at 2–8 °C in a dry, well-ventilated place, protected from light. The product is light- and moisture-sensitive; storage under an inert gas such as argon is recommended. Store locked up. Incompatible materials: strong oxidizing agents, strong acids.

Section 8. Exposure controls/personal protection

OSHA permissible exposure limit (PEL), ACGIH Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available	No OSHA PEL or ACGIH TLV has been established.
Appropriate engineering controls	Handle in a chemical fume hood or with local exhaust ventilation that keeps airborne dust as low as possible, especially in confined areas. Provide an eyewash station and safety shower close to the work area.
Individual protection measures, such as personal protective equipment	Eye/face protection: chemical safety goggles or safety glasses with side shields meeting 29 CFR 1910.133; add a face shield where dust or splashing is likely. Skin and hand protection: chemical-resistant gloves, for example nitrile rubber (minimum thickness 0.11 mm; breakthrough time 480 min reported for the solid). Inspect gloves before use and remove them without touching the outer surface. Wear a laboratory coat or other protective clothing to prevent skin contact. Respiratory protection: where dust may be generated or ventilation is inadequate, use a NIOSH-approved particulate respirator (N95/P95 or better) under a respiratory protection program meeting 29 CFR 1910.134. Hygiene: wash hands and face after handling and before breaks. Contaminated work clothing must not be taken out of the workplace.

Section 9. Physical and chemical properties

Physical state	Solid: crystalline powder (per specification).
Color	White to off-white (per specification).
Odor (includes odor threshold)	Odorless. Odor threshold: no information available.
Melting point/freezing point	198–212 °C (per specification).
Boiling point (or initial boiling point or boiling range)	No applicable information available.
Flammability	No test data available. The product is not classified as a flammable solid.
Lower and upper explosion limit/flammability limit	No applicable information available.
Flash point	No applicable information available.
Auto-ignition temperature	No applicable information available.
Decomposition temperature	No decomposition temperature has been determined. The material melts with decomposition at about 200 °C.
pH	4.1 (0.16% aqueous solution).
Kinematic viscosity	Not applicable (solid).

Solubility	Water: slightly soluble. Acetonitrile: 1 g dissolves in 10 mL to give a clear solution (per specification).
Partition coefficient n-octanol/water (log value)	No applicable information available.
Vapor pressure (includes evaporation rate)	Vapor pressure: no data available. Evaporation rate: not applicable (solid).
Density and/or relative density	No applicable information available.
Relative vapor density	Not applicable (solid).
Particle characteristics	No particle size data available. Supplied as a crystalline powder.

Section 10. Stability and reactivity

Reactivity	No hazardous reactivity is known under normal conditions of use.
Chemical stability	Stable under recommended storage conditions (refrigerated, dry, protected from light). Light- and moisture-sensitive.
Possibility of hazardous reactions, including those associated with foreseeable emergencies	None under normal processing. Hazardous polymerization does not occur.
Conditions to avoid (e.g., static discharge, shock, or vibration)	Excess heat; flames and sparks; dust formation; exposure to moisture and light; contact with incompatible materials.
Incompatible materials	Strong oxidizing agents, strong acids.
Hazardous decomposition products	Under fire conditions: carbon monoxide, carbon dioxide, nitrogen oxides (NOx), phosphorus oxides and hydrogen fluoride.

Section 11. Toxicological information

Information on the likely routes of exposure (inhalation, ingestion, skin, and eye contact)	Inhalation of dust, skin contact and eye contact are the likely routes of occupational exposure. Ingestion is possible but not expected in normal laboratory use.
Symptoms related to the physical, chemical, and toxicological characteristics	Skin: irritation; allergic skin reaction (redness, rash, itching). Eyes: serious eye irritation. Inhalation: respiratory tract irritation (coughing). Sensitized persons have reported rhinitis, asthma-like symptoms and anaphylaxis. Ingestion: no specific data; may be harmful if swallowed.

Delayed and immediate effects and also chronic effects from short- and long-term exposure	Immediate effects: irritation of the skin, eyes and respiratory tract. Delayed effects: skin sensitization may develop after skin contact; once sensitized, a person can react to very small exposures. Occupational cases of airborne allergic sensitization to HBTU (rhinitis, asthma, anaphylaxis) have been reported; HBTU is not classified as a respiratory sensitizer on the available data. Chronic effects: no data available. Germ cell mutagenicity, carcinogenicity, reproductive toxicity and specific target organ toxicity after repeated exposure have not been investigated. The toxicological properties have not been fully investigated.
Numerical measures of toxicity (such as acute toxicity estimates)	Acute oral toxicity: LD50 > 2,000 mg/kg (rat). Acute dermal and inhalation toxicity: no data available. Skin sensitization: local lymph node assay (mouse) positive, EC3 0.90% (Graham et al., Chem. Res. Toxicol. 2022); sub-category 1A.
Interactive effects; information on interactions should be included if relevant and readily available	No information available.
Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA	Not listed by NTP, IARC or OSHA.
When specific chemical data or information is not available, whether alternative information is used and the method used to derive the information (e.g., information from a class of chemicals rather than the exact chemical, using SAR)	No. The classification and the data above are for this substance (supplier classifications, a mouse LLNA and an oral LD50). Human case reports involving HBTU and related uronium coupling reagents are cited only as supporting information; no analogue or structure-activity data were used to derive a classification.

Section 12. Ecological information

Ecotoxicity (aquatic and terrestrial, where available)	No ecotoxicity data available. Do not allow the product to enter drains, surface water or groundwater.
Persistence and degradability	May persist, based on the information available.
Bioaccumulative potential	No data available.
Mobility in soil	Not likely to be mobile in the environment because of its low water solubility.
Other adverse effects (such as hazardous to the ozone layer)	No data available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging	Dispose of the product and any contaminated packaging through a licensed waste disposal company, in accordance with local, state and federal regulations. Waste generators must determine whether the discarded material is a hazardous waste. The material may be dissolved in or mixed with a combustible solvent and burned in a chemical incinerator equipped with an afterburner and scrubber. Dispose of contaminated packaging as unused product.

Section 14. Transport information

US DOT: not regulated.

IMDG: not offered — P3 does not ship by sea.

IATA: not regulated.

UN number	See above: not regulated by any mode P3 ships by.
UN proper shipping name	See above: not regulated by any mode P3 ships by.
Transport hazard class(es)	See above: not regulated by any mode P3 ships by.
Packing group, if applicable	See above: not regulated by any mode P3 ships by.
Environmental hazards (e.g., Marine pollutant (Yes/No))	See above: not regulated by any mode P3 ships by.
Transport in bulk (according to IMO instruments)	Not applicable. P3 BioSystems does not ship this product in bulk or by sea.
Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises	Not regulated as a dangerous good for transport. Keep containers tightly closed and protect them from heat, moisture and physical damage.

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product in question	TSCA: The chemicals shipped by P3 BioSystems are not subject to TSCA. SARA 302: no components subject to reporting. SARA 313: no components above the de minimis reporting levels. SARA 311/312 hazard categories: skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; specific target organ toxicity (single or repeated exposure). CERCLA: contains no hazardous substances with a reportable quantity. California Proposition 65: contains no listed chemicals.

Section 16. Other information, including date of preparation or last revision

The date of preparation of the SDS or the last change to it	Date of preparation: 2026-10-07.

The information above is believed to be accurate and represents the best information available to P3 BioSystems on the date of preparation. It is provided for the safe handling of the product by trained persons in a laboratory and is not a warranty of any kind.