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	HATU (product number 31006)
Other means of identification	HATU (P3 BioSystems product number 31006).
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)	• Flammable solids, category 1 • Skin corrosion/irritation, category 2 • Eye damage/irritation, category 2A • Sensitization - skin, category 1 (including both sub-categories 1A and 1B) (sub-category 1A) • Sensitization - respiratory, category 1 (including both sub-categories 1A and 1B) • Specific target organ toxicity (single exposure), category 3

Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of § 1910.1200	**Signal word: Danger** Hazard pictograms: Flame, Exclamation Mark, Health Hazard Hazard statements: • H228 Flammable solid. • H315 Causes skin irritation. • H319 Causes serious eye irritation. • H317 May cause an allergic skin reaction. • H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. • H335 May cause respiratory irritation. Precautionary statements: • P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. • P240 Ground and bond container and receiving equipment. • P241 Use explosion-proof electrical/ventilating/lighting equipment. • 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. • P284 In case of inadequate ventilation wear respiratory 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. • P342+P311 If experiencing respiratory symptoms: Call a poison center or doctor. • P362+P364 Take off contaminated clothing and wash it before reuse. • P370+P378 In case of fire: Use water spray, carbon dioxide, dry chemical or alcohol-resistant foam to extinguish. • 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-hydroxy-7-azabenzotriazole (HOAt), with hexafluorophosphate salts. 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-oxidotriazolo[4,5-b]pyridin-3-ium-1-yl)methylidene]-dimethylazanium hexafluorophosphate
Common name and synonyms	HATU; O-(7-Azabenzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate; 2-(7-Aza-1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate; 1-[Bis(dimethylamino)methylene]-1H-1,2,3-triazolo[4,5-b]pyridinium 3-oxide hexafluorophosphate.
CAS number and other unique identifiers	• CAS number: 148893-10-1 • InChIKey: FKBFHOSFPRWJNV-UHFFFAOYSA-N • PubChem CID: 6409673
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 breathing is difficult or respiratory symptoms such as wheezing, coughing or chest tightness develop, call a poison center or doctor and get medical attention immediately. If not breathing, give artificial respiration. Skin contact: Take off contaminated clothing immediately. 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 sensitized persons, allergy or asthma symptoms such as sneezing, coughing, wheezing, throat tightness and shortness of breath. Severe allergic reactions, including anaphylaxis, have been reported in laboratory workers repeatedly exposed to HATU and related uronium coupling reagents. Once a person is sensitized, very small exposures can trigger a reaction.
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. A person who has reacted to this product, or to related uronium coupling reagents such as HBTU or HCTU, should avoid further exposure. 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, or dry sand. Unsuitable extinguishing media: No information available.
Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products)	Flammable solid. Fine dust dispersed in air may form an explosive mixture. Containers may explode when heated; there is a risk of explosion if the material is heated under confinement, and of explosive decomposition. Avoid shock and friction during fire fighting. 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. Fight the fire from a safe distance; cool unopened containers with water spray. Prevent fire-fighting water from entering drains, surface water or groundwater.

Section 6. Accidental release measures

Personal precautions, protective equipment, and emergency procedures	Remove all sources of ignition. Evacuate unnecessary personnel. 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.
Methods and materials for containment and cleaning up	Prevent the product from entering drains. Without creating dust, sweep up or collect with an electrically protected vacuum cleaner and place in 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 heat, sparks, open flames and other ignition sources; no smoking. Take measures to prevent the build-up of electrostatic charge: ground and bond containers and receiving equipment. Avoid shock, friction and heating under confinement. Do not take contaminated work clothing out of the workplace; wash it before reuse. Wash hands and face after handling and before breaks.
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, in an area suitable for flammable solids and away from heat and ignition sources. Store locked up. Incompatible materials: strong oxidizing agents.

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. Use explosion-proof electrical, ventilating and lighting equipment where dust clouds can occur. 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; flame-retardant, antistatic protective clothing is recommended. Respiratory protection: this product is a respiratory sensitizer. 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)	No information available (odor and odor threshold).
Melting point/freezing point	178–188 °C (per specification).
Boiling point (or initial boiling point or boiling range)	No applicable information available.
Flammability	Flammable solid. Burning rate test: burning rate > 2.2 mm/s or burning time < 45 s, and the flame passed the wetted zone.
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 (183–191 °C reported) and there is a risk of explosion if it is heated under confinement.
pH	No applicable information available.
Kinematic viscosity	Not applicable (solid).
Solubility	Water: no information available. Acetonitrile: forms a clear solution (per specification solution test).
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. Like other flammable organic solids, finely divided dust whirled up in air can form an explosive mixture. Risk of explosion if heated under confinement.
Chemical stability	Stable under recommended storage conditions (refrigerated, dry, protected from light).
Possibility of hazardous reactions, including those associated with foreseeable emergencies	Violent reactions are possible with strong oxidizing agents. Decomposition on strong heating may be explosive, especially under confinement. Hazardous polymerization does not occur.

Conditions to avoid (e.g., static discharge, shock, or vibration)	Heat, flames, sparks and other ignition sources; strong heating, particularly under confinement; shock and friction; dust formation; moisture and light.
Incompatible materials	Strong oxidizing agents.
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); in sensitized persons, allergy or asthma symptoms - sneezing, runny nose, wheezing, shortness of breath, throat tightness - and, in reported cases, 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, and respiratory sensitization after repeated inhalation; once sensitized, a person can react to very small exposures with allergic skin reactions, asthma-like symptoms or anaphylaxis. Cases have been reported among laboratory workers handling HATU and related uronium coupling reagents (HBTU, HCTU). 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, OECD 429) positive; sub-category 1A in a published LLNA study (Graham et al., Chem. Res. Toxicol. 2022).
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 positive mouse LLNA and an oral LD50). Human case reports involving related uronium coupling reagents (HBTU, HCTU) 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	No data available.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
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 burned in a chemical incinerator equipped with an afterburner and scrubber; take extra care, as it is a flammable solid. Keep waste in its original container, do not mix it with other waste, and handle uncleaned containers like the product itself.

Section 14. Transport information

US DOT: regulated; see 14.a–14.e.

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

IATA: regulated; see 14.a–14.e.

UN number	• US DOT: UN1325 • IATA: UN1325

UN proper shipping name	• US DOT: Flammable solid, organic, n.o.s. (O-(7-azabenzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate) • IATA: Flammable solid, organic, n.o.s. (O-(7-azabenzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate)
Transport hazard class(es)	• US DOT: 4.1 • IATA: 4.1
Packing group, if applicable	• US DOT: II • IATA: II
Environmental hazards (e.g., Marine pollutant (Yes/No))	• US DOT: not a marine pollutant • IATA: not a marine pollutant
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	Division 4.1 flammable solid: during transport and when moving containers on site, keep packages closed, upright and away from heat, sparks and open flames, and protect them from 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: flammable (solid); 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.