



1 Identification Product identifier Product name: 3-Bromo-2-fluoroacetophenone Stock number: H62708 CAS Number: 161957-61-5 Relevant identified uses of the substance or mixture and uses advised against. Identified use: SU24 Scientific research and development Details of the supplier of the safety data sheet Manufacturer/Supplier: Alfa Aesar Ana Aesan Thermo Fisher Scientific Chemicals, Inc. 30 Bond Street Ward Hill, MA 01835-8099 Tel: 800-343-0660 Fax: 800-322-4757 Fax: 800-322-4757 Email: tech@alfa.com www.alfa.com Information Department: Health, Safety and Environmental Department Emergency telephone number: During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789. 2 Hazard(s) identification Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS) ! GHS07 Skin Irrit. 2 H315 Causes skin irritation. Eye Irrit. 2A H319 Causes serious eye irritation. STOT SE 3 H335 May cause respiratory irritation. Hazards not otherwise classified No information known. Label elements GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS) Hazard pictograms ! GHS07 Signal word Warning Hazard statements Hazard Statements H315 Causes skin irritation. H319 Causes serious eye irritation. H335 May cause respiratory irritation. Precautionary statements Preclautionary statements P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P280 Wear protective gloves/protective clothing/eye protection/face protection. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P405 Store locked up. Dispose of contents/container in accordance with local/regional/national/international regulations. WHMIS classification D2B - Toxic material causing other toxic effects Т Classification system HMIS ratings (scale 0-4) (Hazardous Materials Identification System) Health (acute effects) = 1 Flammability = 1 1 FIRE **1** Flammability = 1 Flammability = 1 Physical Hazard = 1 Other hazards Results of PBT and vPvB assessment PBT: Not applicable. vPvB: Not applicable. 3 Composition/information on ingredients Chemical characterization: Substances CAS# Description: 161957-61-5 3-Bromo-2-fluoroacetophenone 4 First-aid measures Description of first aid measures After inhalation Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice. After skin contact Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice. After eye contact Rinse opened eye for several minutes under running water. Then consult a doctor. After swallowing Seek medical treatment. (Contd. on page 2)

## Product name: 3-Bromo-2-fluoroacetophenone (Contd. of page 1) Information for doctor Most important symptoms and effects, both acute and delayed No further relevant information available. Indication of any immediate medical attention and special treatment needed No further relevant information available. 5 Fire-fighting measures Extinguishing media Suitable extinguishing agents Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam. Special hazards arising from the substance or mixture If this product is involved in a fire, the following can be released: Carbon monoxide and carbon dioxide Hydrogen fluoride (HF) Hydrogen bromide (HBr) Advice for firefighters Protective equipment: Wear self-contained respirator. Wear fully protective impervious suit. 6 Accidental release measures Personal precautions, protective equipment and emergency procedures Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation Environmental precautions: Do not allow product to reach sewage system or any water course. Methods and material for containment and cleaning up: Ensure adequate ventilation. Prevention of secondary hazards: No special measures required. Reference to other sections See Section 7 for information on safe handling See Section 8 for information on personal protection equipment. See Section 13 for disposal information. 7 Handling and storage Handling Precautions for safe handling Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace. Information about protection against explosions and fires: No information known. Conditions for safe storage, including any incompatibilities Storage Requirements to be met by storerooms and receptacles: No special requirements. Information about storage in one common storage facility: Store away from oxidizing agents. Further information about storage conditions: Keep container tightly sealed. Store in cool, dry conditions in well sealed containers. Specific end use(s) No further relevant information available. 8 Exposure controls/personal protection Additional information about design of technical systems: Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Control parameters Components with limit values that require monitoring at the workplace: product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace. Additional information: No data Exposure controls Exposure controls Personal protective equipment General protective and hygienic measures The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Avoid contact with the aves and exin. Avoid contact with the eyes and skin. Maintain an ergonomically appropriate working environment. **Breathing equipment:** Use suitable respirator when high concentrations are present. Recommended filter device for short term use: Use a respirator with type N95 (USA) or PE (EN 143) cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards. Protection of hands: Impervious gloves Check protective gloves prior to each use for their proper condition. The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer. Eye protection: Safety glasses Body protection: Protective work clothing. 9 Physical and chemical properties Information on basic physical and chemical properties General Information Appearance: Form: Solid Odor: Not determined Odor threshold: Not determined pH-value: Not applicable Change in condition Melting point/Melting range: Not determined Boiling point/Boiling range: Sublimation temperature / start: Flammability (solid, gaseous) Not determined Not determined Not determined Ignition temperature Not determined

## Product name: 3-Bromo-2-fluoroacetophenone

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Reactivity No information known.         Chemical stability Stability Stability counter recommended storage conditions.         Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.         Possibility of hazardous reactions Reacts with strong oxidizing agents         Conditions to avoid No further relevant information available.         Hazardous decomposition products:         Carbon monoxide and carbon dioxide         Hydrogen Ibunde         1 Toxicological information         Information on toxicological effects         Actual toxicity: No effects known.         Exercised on corrosion: Causes serious eve irritation.         Sensitization or corrosion: Causes serious eve irritation.         Sensitization: No sensitization of accornogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.         Specific target organ system toxicity - repeated exposure: No effects known.         Specific target organ system toxicity - repeated exposure: No effects known.         Subacute to chronic toxicity: No effects known.         Zecological information         Toxicological fibrormation:         Specific target organ system toxicity - repeated exposure: Ne effects known.         Specific target organ system toxicity - repeated exposure: Ne effects known.         Additional toxicological information:         Cological informatio			(Contd. of page 2
Explosion limits: Met delemined by the second limits with the delemined by the second limits with the second limits with the delemined by the second limits with the secon			
Lower: Mod applicable province and applicable province and applicable province and applicable sequence and applicable		Not determined.	
Value pressure:         Mot applicable           Vector         Not influence           Vector         Not influence <t< td=""><td>Lower:</td><td></td><td></td></t<>	Lower:		
Details Provide			
Vego redshifty         Mot applicable.           Solubility IV Maching With         Not applicable.           Solubility IV Maching With         Not applicable.           Water:         Control (Incomplexence).           Solubility IV Maching With         Not applicable.           Other Information         Mot applicable.           Other Information         Not applicable.           Other Information in two controls in the other and outper controls.         Persibility of heardoup products:           Hydrogen hornde         Heardoup reducts:         Persibility of heardoup reducts:           Hydrogen hornde         General Scheer (Intel Intel Inte	Density:	Not determined	
Eventuation rate:         Not depolicable.           Wate:         Not depolicable.           Wate:         Not depolicable.           Openative:         Not applicable.           Openative:         Not applicable.           Openative:         Not applicable.           Openative:         Not applicable.           Parallion scottling in the index relation index information available.         Internation           O Stability and resettivity         Resettivity Not uptor index to be writed applicable.           Parallicing:         Not applicable.         Internation           Conditions to a world No internation available.         Internation available.         Internation available.           11 Toxicological information         Internation available.         Internation available.         Internation available.           12 Toxicological information         Internation available.         Internation available.         Internation available.           13 Toxicological information         Classification: No data symmetry available.         Internation available.         Internation available.           14 Toxicological information         Classification: No data symmetry available.         Internation available.         Internation available.           15 Conciological information         Classification toxicological information.         Symmetry avaintoxicity on avail	Relative density Vapor density		
Particip coefficient (n-octanol/water): Not determined:           Vacability:         Not determined:           O Stability and reactivity           Participation:         Not turber relevant information available.           O Stability and reactivity           Participation:         Not turber relevant information available.           O Stability and reactivity         Not turber relevant information available.           O Stability and reactivity         Not turber relevant information available.           Participation:         Not turber relevant information available.           I Orderological Information         Not turber relevant for classification: No data for the set of turber relevant information available.           I Orderological Information         Information on toricological effects for the set information available.           I Orderological Information         Information on toricological effects for the set information.           I Directory in the set information in formation of the orderol information.         Information on toricological effects for the set information.           I Directory in the set information in toricological effects for the set information.         Information on toricological effects for the set information.           I Directory in the set information in toricological effects for the set information.         Information information.           I Directory in the set information in the methaninformatin information available.         Information i	Evaporation rate Solubility in / Miscibility with	Not applicable.	
dynamic:         Mod applicable Mode information           0         Stability and reactivity           0         Stability and reactivity           0         Stability of information known.           0         Stability and reactivity           0         Stability of information known.           1         Stability of information products:           2 achon monocities and cando disable.         Stability of information on outcloological effects           1         Toxicological effects known.         Stability of information information.           1         Noticological effects known.         Stability of information.           2         Stability of information information information stable.         Stability of information.           1         Toxicological information information.         Stability of information.           2         Stability of information information.         Stability information.           2         Stability in formation on or corresport.         Stability information.           2         St	Partition coefficient (n-octanol/water		
Other Information         No further relevant information available.           0 Stability and reactivity           Rescrity for information forom. Commission and the store of the s	dynamic:		
Beactivity No Information Incom.         Chemical statistics Statistic material scoregize conditions:         The might decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.           Conditions to avoid Mo Luther relevant information avoidable.         Specifications         Specifications           Incompatible materials: Conditions to avoidable.         Specifications         Specifications           Incompatible materials: Conditions to avoidable.         Specifications         Specifications           Incompatible materials: Conditions to accompatible materials: Conditions to avoidable.         Specifications         Specifications           Incompatible materials: Conditions to accompatible materials: Solutions:         Specifications         Specifications           Incompatible materials: Conditions:         Specifications:         Specifications         Specifications           Incompatible materials: Solution:         Specifications:         Specifications         Specifications           Specification:         No science of the specification:         Specifications:         Specifications:           Specification:         No science of the specification:         Specification:         Specification:           Specification:         No science of the specification:         Specification:         Specification:           Specificatinde:         Specification:         Specificatin			
Chemical stability Stability of the processing of the storage conditions. Premaid decomposition is considered. Decomposition will not occur if used and stored according to specifications. Premaid decomposition is considered. Decomposition will not occur if used and stored according to specifications. Premaid decomposition is considered. Premain decomposition is decomposition is decomposition is decomposition is decomposition. Premain decomposition is decomposition is decomposition is decomposition is decomposition is decomposition is decomposition. Premain decomposition is decom	10 Stability and reactivity		
Information on toxicological effects           Acute toxicity: No effects known.           LDL 250 values that are relevant for classification: No data           Skm initiation: No sensitizing effects known.           Germ cell musquenicity: No elessification effects known.           Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.           Spration fractions of the effects known.           Subscript for the toxicity: No effects known.           Subscript for the toxicity: No effects known.           Subscript for the effects known.           Subscrest mode effects known.	Chemical stability Stable under recom Thermal decomposition / conditions Possibility of hazardous reactions Re Conditions to avoid No further relevar Incompatible materials: Oxidizing age Hazardous decomposition products: Carbon monoxide and carbon dioxide Hydrogen fluoride	<b>to be avoided:</b> Decomposition will not occur if used and stored according to specifications. eacts with strong oxidizing agents t information available.	
Toxicity       Not further relevant information available.         Persistence and degradability No further relevant information available.         Bioaccumulative opticatial No further relevant information available.         Mobility in soil No further relevant information available.         Additional ecological information         General notes:         Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.         Avoid transfer into the environment.         Results of PBT and VPUB assessment         PBT: Not applicable.         VPVE: Not applicable.         Orther adverse effects No further relevant information available.         3 Disposal considerations         Waste treatment methods         Recommendation Consult state, local or national regulations to ensure proper disposal.         Uncleaned packagings:         Recommendation: Disposal must be made according to official regulations.         4 Transport information         UN-Number         Dor, ADN, IMDG, IATA         Not applicable         UN-Number         Dor, ADN, IMDG, IATA         Not applicable         Transport hazard class(es)         Dor, ADN, IMDG, IATA         Not applicable         Packing group         Dor, ADR, ADN, IMDG, IATA	Acute toxicity: No effects known. LD/LC50 values that are relevant for Skin irritation or corrosion: Causes s Eye irritation or corrosion: Causes s Sensitization: No sensitizing effects kn Germ cell mutagenicity: No effects kno Carcinogenicity: No classification data Reproductive toxicity: No effects known Specific target organ system toxicity Specific target organ system toxicity Aspiration hazard: No effects known. Subacute to chronic toxicity: No effects	kin irritation. rious eye irritation. own. o on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. <i>n.</i> - <b>repeated exposure:</b> No effects known. - <b>single exposure:</b> May cause respiratory irritation. cts known.	
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment. Results of PBT and vPVB assessment PBT: Not applicable. vPVB: Not applicable. other adverse effects No further relevant information available. 3 Disposal considerations Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations. 4 Transport information UN-Number DOT, ADN, IMDG, IATA Not applicable VN, IMDG, IATA Not applicable Packing group DOT, ADN, IMDG, IATA Not applicable Packing group DOT, IMDG, IATA Not applicable Invironmental hazards: Not applicable Not applicable Not applicable Transport in bulk according to Annex II of MARPOLT3/78 and the IBC Code Not applicable.	Toxicity Aquatic toxicity: No further relevant in Persistence and degradability No furt Bioaccumulative potential No further Mobility in soil No further relevant info	her relevant information available. relevant information available.	
Other adverse effects No further relevant information available.         3 Disposal considerations         Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings: Recommendation: Disposal must be made according to official regulations.         4 Transport information         UN-Number DOT, ADN, IMDG, IATA         Not applicable         UN proper shipping name DOT, ADN, IMDG, IATA         Not applicable         Transport nazard class(es)         DOT, ADR, ADN, IMDG, IATA         Not applicable         Transport hazard class(es)         DOT, ADR, ADN, IMDG, IATA         Not applicable         Packing group DOT, IMDG, IATA         Not applicable         Packing group DOT, IMDG, IATA         Not applicable         Packing group DOT, IMDG, IATA         Not applicable         Environmental hazards:         Not applicable         Special precautions for user         Not applicable.         Transport in bulk according to Annex II of MARPOLT3/78 and the IBC Code Not applicable.	Do not allow undiluted product or large Avoid transfer into the environment. <b>Results of PBT and vPvB assessmer</b> <b>PBT:</b> Not applicable.		
Waste treatment methods Recommendation Consult state, local or national regulations to ensure proper disposal. Uncleaned packagings:         4 Transport information         UN-Number DOT, ADN, IMDG, IATA         Not applicable         UN proper shipping name DOT, ADN, IMDG, IATA         Not applicable         Transport hazard class(es)         DOT, ADN, IMDG, IATA         Not applicable         Packing group DOT, IMG, IATA         Packing group DOT, IMG, IATA         Not applicable         Finvironmental hazards:         Not applicable.         Special precautions for user         Not applicable.         Transport in bulk according to Annex II of MARPOLT3/78 and the IBC Code Not applicable.	Other adverse effects No further relev	ant information available.	
UN-Number       Not applicable         DOT, ADN, IMDG, IATA       Not applicable         UN proper shipping name       Not applicable         DOT, ADN, IMDG, IATA       Not applicable         Transport hazard class(es)       Not applicable         DOT, ADR, ADN, IMDG, IATA       Not applicable         Packing group       Not applicable         DOT, IMDG, IATA       Not applicable         Packing group       Not applicable         DOT, IMDG, IATA       Not applicable         Special precautions for user       Not applicable.         Special precautions for user       Not applicable.         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.       Not applicable.	Recommendation Consult state, local Uncleaned packagings:		
DOT, ADN, IMDG, IATA       Not applicable         UN proper shipping name DOT, ADN, IMDG, IATA       Not applicable         Transport hazard class(es)       Not applicable         DOT, ADR, ADN, IMDG, IATA       Not applicable         Packing group DOT, IMDG, IATA       Not applicable         Packing group DOT, IMDG, IATA       Not applicable         Environmental hazards:       Not applicable.         Special precautions for user       Not applicable.         Transport in bulk according to Annex II of MARPOLT3/78 and the IBC Code Not applicable.       Not applicable.	14 Transport information		
Transport hazard class(es)         DOT, ADR, ADN, IMDG, IATA         Class       Not applicable         Packing group       Not applicable         DOT, IMDG, IATA       Not applicable         Environmental hazards:       Not applicable.         Special precautions for user       Not applicable.         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.	DOT, ADN, IMDG, IATA	Not applicable	
DOT, ADR, ADN, IMDG, IATA       Not applicable         Class       Not applicable         Packing group       Not applicable         DOT, IMDG, IATA       Not applicable         Environmental hazards:       Not applicable.         Special precautions for user       Not applicable.         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.		Not applicable	
Class       Not applicable         Packing group DOT, IMDG, IATA       Not applicable         DOT, IMDG, IATA       Not applicable         Environmental hazards:       Not applicable.         Special precautions for user       Not applicable.         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.			
Environmental hazards:       Not applicable.         Special precautions for user       Not applicable.         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.	Class	Not applicable	
Environmental hazards:       Not applicable.         Special precautions for user       Not applicable.         Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.	Packing group DOT, IMDG, IATA	Not applicable	
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.			
	Special precautions for user	Not applicable.	
	Transport in bulk according to Annex	x II of MARPOL73/78 and the IBC Code Not applicable.	

(Contd. on page 4) USA Safety Data Sheet per OSHA HazCom 2012

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Product name: 3-Bromo-2-fluoroacetoph	nenone
•	(Contd. of page
Transport/Additional information:	
DOT Marine Pollutant (DOT):	No
UN "Model Regulation":	-
45 Decudedom cinformación a	
15 Regulatory information Safety, health and environmental regulation	ns/legislation specific for the substance or mixture
GHS label elements The product is classified Hazard pictograms	and labeled in accordance with 29 CFR 1910 (OSHA HCS)
GHS07	
Signal word Warning	
Hazard statements H315 Causes skin irritation.	
H319 Causes serious eye irritation.	
H335 May cause respiratory irritation. Precautionary statements	
P261 Avoid breathing dust/fume/ P280 Wear protective gloves/pro	/gas/mist/vapours/spray. Stective clothing/eye protection/face protection. Isly with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. son to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiou P304+P340 IF INHALED: Remove pers	siy with water for several minutes. Remove contact lenses, it present and easy to do. Continue rinsing. son to fresh air and keep comfortable for breathing.
	iner in accordance with local/regional/national/international regulations.
National regulations This product is not listed in the U.S. Environm	nental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted
to research and development only. This produ	ict must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This poses or in formulations for commercial purposes.
This product is not listed on the Canadian Dor SARA Section 313 (specific toxic chemical	mestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).
California Proposition 65 Prop 65 - Chemicals known to cause cance	
Prop 65 - Developmental toxicity Substance	e is not listed.
Prop 65 - Developmental toxicity, female Sup Prop 65 - Developmental toxicity, male Sub Information about limitation of use: For use	ustance is not listed.
Other regulations, limitations and prohibiti	e only by technically qualified individuals. ive regulations ccording to the REACH Regulations (EC) No. 1907/2006. Substance is not listed.
Substance of Very High Concern (SVHC) and The conditions of restrictions according to	ccording to the REACH Regulations (EC) No. 1907/2006. Substance is not listed. Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the sec
market and use must be observed. Substance is not listed.	
	uiring Authorisation for use) Substance is not listed.
16 Other information Employers should use this information only as	s a supplement to other information gathered by them, and should make independent judgement of suitability of this
information to ensure proper use and protect t conformance with this Material Safety Data SI	the health and safety of employees. This information is furnished without warranty, and any use of the product not in heet, or in combination with any other product or process, is the responsibility of the user.
Department issuing SDS: Global Marketing	Department
Date of preparation / last revision 11/24/20 Abbreviations and acronyms:	
DOT: US Department of Transportation	angereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) Themical Society)
CAS: Chemical Abstracts Service (division of the American C HMIS: Hazardous Materials Identification System (USA) WHMIS: Workplace Hazardous Materials Information System LC50: Lethal concentration, 50 percent	ı (Canada)
ACGIH: American Conference of Governmental Industrial Hy OSHA: Occupational Safety and Health Administration (USA)	rgienists (USA)
LD50: Letrial ouse, 50 percent VPVB: very Persistent and very Bioaccumulative ACGIH: American Conference of Governmental Industrial Hy OSHA: Occupational Safety and Health Administration (USA, NTP: National Toxicology Program (USA) IARC: International Agency for Research on Cancer EPA: Environmental Protection Agency (USA)	
	USA