Maximizing the Value of Flotation Chemicals Technology

SAFETY DATA SHEET

1. IDENTIFICATION

Product identifier used on the label

: **Flottec SIBX Collector**

Recommended use of the chemical and restrictions on use

: Collector used in mining industry

Chemical family : Xanthate

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party:

Flottec, LLC
2505 Collingsworth Street, 2nd Floor
Houston, TX 77026 U.S.A.
www.flottec.com

Information Telephone # : 1-713-425-7055

24 Hr. Emergency Tel # : Chemtrec 1-800-424-9300 (Within Continental U.S.); Chemtrec 703-527-3887 (Outside U.S.)

2. HAZARDS IDENTIFICATION

Classification of the chemical

Self-heating substances and mixtures (Category 1)
Combustible Dust
Acute toxicity, oral (Category 4)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 4)
Skin corrosion/irritation (Category 1)
Serious eye damage/eye irritation (Category 1)
Skin sensitizer (Category 1)
Specific target organ toxicity, single exposure (Category 3)
Specific target organ toxicity, repeated exposure (Category 2)

Label elements

Signal Word

Danger

Hazard statement(s)

H251: Self-heating; may catch fire
H29x : May form combustible dust concentrations in air
H311: Toxic in contact with skin
H314: Causes severe skin burns and eye damage
H302 + H332: Harmful if swallowed or if inhaled
H317: May cause an allergic skin reaction
H335: May cause respiratory irritation
H336: May cause drowsiness or dizziness
H373: May cause damage to organs through prolonged or repeated exposure by inhalation
H411: Toxic to aquatic life with long lasting effects

Precautionary statement(s)

P260: Do not breathe dusts, vapors, fumes and gas.
P264: Wash face, hands and any exposed skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.
P280: Wear protective gloves, protective clothing and eye protection.
P301+330+331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+361+353: IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water and soap or take a shower if necessary.

P363: Wash contaminated clothing before reuse.

P333+313: If skin irritation or a rash occurs: Get medical advice/attention.

P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+351+338: IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P361 + P364: Remove/Take off immediately all contaminated clothing and wash before reuse.

P391: Collect spillage.

P403+P235+P233: Store in a well-ventilated place. Keep container tightly closed. Keep cool.

P405: Store locked up.

P407: Maintain air gap between stacks/pallets.

P413: Stock bulk masses at temperature not exceeding 32°C/90°F.

P420: Store away from other materials.

P501: Dispose of contents and container to a licensed chemical disposal agency in accordance with local, regional and national regulations.

Hazard pictogram(s)

Other hazards

Acute hazard to the aquatic environment (Category 2).

Long-term hazard to the aquatic environment (Category 2)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Common name	CAS #	Concentration / wt %
Sodium isobutyl xanthate	25306-75-6	>85
Sodium hydroxide	1310-73-2	0-1
Sodium carbonate	497-19-8	0-3
Sodium sulphide	1313-82-2	0-1
Isobutyl alcohol	78-83-1	0-10

The exact concentrations of the above listed chemicals are being withheld as a trade secret.

4. FIRST-AID MEASURES

Description of first aid measures

Ingestion : DO NOT induce vomiting, unless recommended by medical personnel. If victim is conscious wash out mouth with water. Never give anything by mouth if victim is unconscious or convulsing. Seek medical attention or contact a Poison Centre immediately.

Inhalation : Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen by trained personnel. If a problem develops or persists, seek medical attention.

Skin Contact : Wash skin with warm water and mild soap. Remove contaminated clothing and wash before reuse. If a problem develops or persists, seek medical attention.

Eye Contact : IMMEDIATELY flush with plenty of water. Remove contact lenses. Flush with water for at least 15 minutes. Hold eyelids apart to rinse properly. If a problem develops or persists, seek medical attention.

Symptoms : May cause severe eye irritation or eye damage. May cause skin irritation and burns. May cause an allergic reaction of the skin. May cause respiratory tract irritation. High concentrations may cause central nervous system depression characterized by headache, dizziness, vertigo, nausea, drowsiness and fatigue.

Notes to the physician : Treat symptomatically. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

: Dry chemicals, carbon dioxide (CO2). Flood the area with water.

Unsuitable extinguishing media

: Do not use direct water jet.

Special hazards arising from the substance or mixture

: Chemical of sodium alkyl xanthate in contact with water will emit carbon disulfide which is flammable. The dry powder or pellet form may also be flammable because of the presence of moisture in the product. May release irritating, toxic and/or corrosive during fire or when heated to decomposition. May form combustible dust concentrations in air.

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

: Firefighters must wear self contained breathing apparatus with full face mask. Firefighting suit may not be efficient against chemicals.

Special fire-fighting procedures

: Water spray can be used to cool equipment exposed to heat and flame. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: Do not touch spilled material. Make sure to wear personal protective equipment mentioned in this Safety Data Sheet.

Environmental precautions : Do not allow material to contaminate ground water system. For a large spillage, consult the Department of Environment or the relevant authorities.

Methods and material for containment and cleaning up

: Ventilate well the area. Avoid generating dusty conditions. Vacuum or sweep up and place in an appropriate waste disposal container. Finish cleaning by rinsing with water contaminated surface. Dispose via a licensed waste disposal contractor.

7. HANDLING AND STORAGE

Precautions for safe handling : Avoid excessive heat and moisture. Use only in well ventilated area. Avoid breathing dust and fume. Avoid generating dusty conditions. Avoid contact with skin, eyes and clothing. Wear eye protection, gloves and other protective clothing that are adapted to the task being performed and the risks involved. Use non-sparkling and antistatic tools. Do not eat, do not drink and do not smoke during use. Keep containers tightly closed when not used. May form combustible dust concentrations in air. Keep away from heat and open flame. After use, wash hands with soap and water. Wash contaminated clothing before reuse.

Conditions for safe storage : Heating and overexposure to moisture of solid Xanthate and heating or aging of xanthate solutions causes some decomposition to poisonous and flammable carbon disulfide. Storage tank should have certain design features for maximum safety, and the vapor space should be free of sources of ignition. Store tightly close and in properly labelled container. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store away from oxidizing materials and incompatible materials (see section 10). Keep away from moisture. Keep away from direct sunlight and heat.

Storage temperature : 10 to 32°C (50 to 89.6 °F)

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Immediately Dangerous to Life or Health

Hydrogen sulfide : 100 ppm.
Carbon disulfide : 500 ppm.
Sodium hydroxide : 10 mg/m^3.
Isobutyl alcohol : 1600 ppm

Exposure limits

Sodium hydroxide	:	Ceiling		2 mg/m^3	ACGIH, BC, ON, RSST
		TWA (8h)		2 mg/m^3	OSHA
Isobutyl alcohol	:	TWA (8h)	50 ppm		ACGIH, BC, ON
			50 ppm	150 mg/m^3	NIOSH
			50 ppm	152 mg/m^3	RSST
			100 ppm	300 mg/m^3	OSHA
Hydrogen sulfide	:	Ceiling	10 ppm		BC
		STEL	5 ppm		ACGIH
			15 ppm		ON
			15 ppm	21 mg/m^3	RSST
		TWA (8h)		3 mg/m^3	OSHA
			1 ppm		ACGIH
			10 ppm		ON
			10 ppm	14 mg/m^3	RSST
Carbon disulfide	:	STEL	12 ppm		BC
			12 ppm	36 mg/m^3	RSST
			30 ppm		OSHA
		TWA (8h)		20 mg/m^3	OSHA
			1 ppm		ACGIH, ON
			4 ppm		BC
			4 ppm	12 mg/m^3	RSST

Exposure controls

Appropriate engineering controls : Provide sufficient mechanical (general and/or local exhaust) to keep the airborn concentrations of dust below their respective occupational exposure limits.

Respiratory protection : A respirator is not required in a well-ventilated area. Respiratory protection equipment (PPE) must be selected, fitted, maintained and inspected in accordance with regulations and CSA Standard Z 94.4 and approved by NIOSH / MSHA. In case of insufficient ventilation or in confined or enclosed space and for an assigned protection factor (APF) up to 10 times the exposure limit: wear a half mask respirator with appropriate cartridges fitted with P100 filters. For an APF until maximum 100 times of exposure limit, wear a full face respirator mask with appropriate cartridges and P100 filters. For concentrations higher than the Threshold Limit Value, wear any self-contained breathing apparatus that has a full face piece and is operated in a pressure-demand or other positive-pressure mode.

Skin protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Wear an apron or long-sleeve protective coverall suit.

Eye / face protection : Wear chemical splash goggles. If risk of contact with eyes or the face, wear a face shield.

Hands : Wear nitrile or neoprene gloves. Disposable nitrile gloves can also be used, but discard after single use. Gloves must only be worn on clean hands. Wash gloves with water before removing them. After using gloves, hands should be washed and dried thoroughly. Before using, user should confirm impermeability. Discard gloves that show tears, pinholes, or signs of wear.

Other protective equipment : Wear safety shoes.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	Solid in pellets, flakes or powder	**Flammability (solid, gas)**	:	Self-heating substance
Color	:	Yellow-green	**Flammability limits (% by vol.)**	:	N/Ap
Odor	:	Disagreeable	**Flash point**	:	N/Ap
Odor threshold	:	N/Av	**Auto-ignition temperature**	:	> 120°C (248°F)
pH	:	N/Av	**Sensibility to electrostatic charge**	:	No
Melting/Freezing point	:	N/Av	**Sensibility to sparks/friction**	:	No
Boiling point/range	:	N/Ap	**Vapor density (Air = 1)**	:	N/Av
Solubility in water	:	Soluble 53 g/100 g @ 20°C (68 °F)	**Relative density (Water = 1)**	:	1.24 kg/L @ 25°C (77°F)
			Partition coefficient (n-octanol/water)	:	<0
Evaporation rate (BuAc = 1)	:	N/Av	**Decomposition temperature**	:	> 131 °C (267.8°F)
Vapor pressure	:	N/Av	**Viscosity**	:	N/Av
Volatiles (% by weight)	:	N/Av	**Molecular mass**	:	N/Ap

10. STABILITY AND REACTIVITY

Reactivity : This product should not be mixed with acids since evolution of toxic and flammable hydrogen sulfide gas could result. Chemical of sodium alkyl xanthate in contact with water will emit carbon disulfide which is flammable. The dry powder or pellet form may also be flammable because of the presence of moisture in the product.

Chemical stability : Stable under recommended storage conditions.

Possibility of hazardous reactions (including polymerizations)

: Hazardous polymerization will not occur under recommended storage.

Conditions to avoid : Avoid contact with incompatible materials. Avoid generating dusty conditions. Avoid exposure of the solid Xanthate to heat or moisture and heating or aging of xanthate solutions. Avoid excessive heat and moisture.

Incompatible materials : Strong oxidizing agents (such as nitric acid, perchloric acid, peroxides, chlorates and perchlorates), strong acids, strong bases, flammable liquids.

Hazardous decomposition products

: Hydrogen sulfide (H_2S), carbon disulfide (CS_2).

11. TOXICOLOGICAL INFORMATION

Toxicological data

Chemical name	LC_{50} (Inhalation, rat)	LD_{50} / mg/kg (Oral, rat)	LD_{50} / mg/kg (Dermal, rabbit)
Sodium isobutyl xanthate	3.85 mg/l/4h	1290	440
Isobutyl alcohol	19.2 mg/l/4h	2460	3400
Sodium carbonate	1.15 mg/l/4h	2800	>2000
Sodium hydroxide		>140	1350
Sodium sulphide		208	<340
Carbon disulfide	10.35 mg/l/4h	>2000	
Hydrogen sulfide	444 mg/l/4h		

Likely routes of exposure

Skin : Yes
Eye : Yes
Inhalation : Yes
Ingestion : Yes

Potential Health Effects:

Signs and symptoms of delayed, immediate and chronic effects

Skin : May cause skin irritation and burns. The chemical compounds of this group, Sodium Alkyl Xanthate, are highly irritating to the skin in rabbits (OECD 404). The data indicate that butyl alcohol is irritating to the skin (Draize test).

Eye : May cause severe eye irritation or eye damage. The chemical compounds of this group, Sodium Alkyl Xanthate, are severely irritating to the eyes (rabbits, OECD 405). Butyl Alcohol instilled in rabbit eyes resulted in severe corneal irritation and eye damage (OECD 405).

Inhalation : May cause irritation to nose, throat and respiratory tract. High concentrations may cause central nervous system depression characterized by headache, dizziness, vertigo, nausea, drowsiness and fatigue.

Ingestion : Harmful if swallowed. Swallowing will causes digestive tract disturbances resulting in nausea, vomiting, cramps and diarrhea.

Sensitization to material : The chemical compounds of this group, Sodium Alkyl Xanthate, were reported as potential sensitizers (OECD TG 409). There are not respiratory sensitizers.

IRAC/NTP Classification : No ingredients listed

Carcinogenicity : Ingredients present at levels greater than or equal to 0.1% of this product are not listed as a carcinogen by IARC, ACGIH, NIOSH, NTP or OSHA.

Mutagenicity : Ingredients in this product present at levels greater than or equal to 0.1% are not known to cause mutagenic effect.

Reproductive Effects : Ingredients in this product present at levels greater than or equal to 0.1% are not known to cause effects on reproduction.

Specific target organ effects – single exposure

: Central nervous system, respiratory system.

Specific target organ effects – repeated exposure

: Central nervous system.

Other information : The oral acute toxicity estimate (ATE) of the mixture was calculated to be greater than 300 mg/Kg but lower than 2000 mg/kg. This value is classified according to GHS: Acute toxicity, oral (Category 4). The skin acute toxicity estimates (ATE) of the mixture was calculated to be greater than 200 mg/kg but lower than 1000 mg/Kg. This value is classified according to GHS: Acute toxicity, dermal (Category 3). The acute toxicity estimate (ATE) by inhalation (mists/dusts) of the mixture was calculated to be greater than 1 mg/L/4h but lower than 5 mg/L/4h. This value is classified according to GHS: Acute toxicity, inhalation (Category 4).

12. ECOLOGICAL INFORMATION

Ecotoxicity :

Fish - Puntius gonionotus - Fresh water	LC_{50}	0.0027 mg/L; 96 h (sodium sulfide) OECD 203
Aquatic Invertebrate - Indian prawn - Penaeus indicus	EC_{50}	0.063 mg/L; 96 h (sodium sulfide)
Fish - Macropodus opercularis - fresh water	LC_{50}	50 mg/L; 96 h (Sodium isobutyl xanthate) OECD 203
Green Algea, Monoraphidium griffithii	EC_{50}	0.325 mg/L; 72 h (Sodium isobutyl xanthate)

Persistence : Contains an ingredient that may be persistent in aquatic environment.

Degradability : Sodium Alkyl Xanthate is readily chemically decomposes to Isopropyl Alcohol and carbon disulfide, especially in the presence of moisture/water. These compound are readily biodegradable, >60% degraded in 8 days (OECD Guideline 301A). n-Butyl Alcohol is readily biodegradable. Degradation by Biochemical Oxygen Demand BOD (O2 consumption) was reported as 92% after 20 days.

Bioaccumulation potential : Sodium Alkyl Xanthate has a partition factors Log Kow of <0, indicating that it should not accumulate in the food chain. Butyl Alcohol is soluble in water and has a low Bioconcentration Factor (BCF) of 3 and a log Kow of 0.88. BA would not be expected to accumulate in food chains.

Mobility in soil : The estimated Koc value of 6 to 24 suggests that Sodium Alkyl Xanthates are expected to have very high mobility in soil. n-Butyl alcohol is soluble in water. The estimated Koc value of 3.2 suggests that it is expected to have very high mobility in soil..

Other adverse environmental effects

: This chemical does not deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Handling for Disposal : Important! Prevent waste generation. Use in full. DO NOT throw residual to sewer, streams, sewers or drinking water supply. Return empty container properly labeled to supplier or everywhere there is a recovery program. Dispose via a licensed waste disposal contractor. Observe all federal, state/provincial and municipal regulations. If necessary consult the Department of Environment or the relevant authorities.

14. TRANSPORTATION INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
DOT	UN 3342	XANTHATES (SODIUM ISOBUTYL XANTHATE)	4.2	II	Spontaneously Combustible
Additional Information		This material is not listed as a marine pollutant. Permit required for transportation with proper placards displayed on vehicle.			
TDG	UN 3342	XANTHATES (SODIUM ISOBUTYL XANTHATE)	4.2	II	Spontaneously Combustible
Additional Information		Emergency response guidebook 2012 - 135			

IMO/IMDG	UN 3342	XANTHATES (SODIUM ISOBUTYL XANTHATE)	4.2	II	Spontaneously Combustible
Additional Information		Emergency schedules (EmS-No) F-A, S-J			
IATA	UN 3342	XANTHATES (SODIUM ISOBUTYL XANTHATE)	4.2	II	Spontaneously Combustible
Additional Information		This material is FORBIDDEN on Passenger and Cargo Aircraft. Transport only on Cargo Aircraft.			

15 - REGULATORY INFORMATION

US Federal Information:

- Toxic Substance Control Act (TSCA)
  This material is listed in the TSCA Inventory or otherwise comply with TSCA requirements.
- EPCRA Section 313 Toxic Chemicals:
  Sodium hydroxide (CAS no 1310-73-2).
- CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):
  Sodium hydroxide (CAS no 1310-73-2).
  Isobutyl alcohol (CAS no. 78-83-1).
- Clean Water Act (CWA) Priority Pollutants:
  No material is listed.
- Clean Water Act (CWA) 311 Hazardous Substances:
  Sodium hydroxide (CAS no 1310-73-2).
- Clean Air Act (CAA) 111:
  Isobutyl alcohol (CAS no. 78-83-1).
- California Proposition 65:
  No material is listed

Canadian Information:

- Canada DSL and NDSL:
  This product is on the Domestic Substances List (DSL) under: Sodium diethyldithiocarbamate(CAS no 148-18-5).
- Canadian National Pollutant Release Inventory Substances (NPRI):
  Isobutyl alcohol (CAS no. 78-83-1).

WHMIS 1988:

Class B4 : Flammable Solid
Class D1B : Toxic material causing immediate and serious toxic effects
Class D2B : Toxic material causing other toxic effects
Class E : Corrosive material

NFPA

16. OTHER INFORMATION

Other special considerations for handling : Provide adequate information, instruction and training for operators.

Prepared by: Flottec, LLC **Revised by:** B. DeWald

REASON FOR REVISION: Section 1: Updated Flottec Address

DISCLAIMER

The above information is believed to be accurate and represents the best information currently available to us. However, we make no warrantee of merchantability or any other warrant, expressed or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular uses.

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