Vanderbilt Minerals, LLC
A Wholly Owned Subsidiary of R.T. Vanderbilt Holding Company, Inc.

Material Safety Data Sheet

US
English

1 . Product and company identification

Product name ACTIV-8®

In case of emergency

Supplier/Manufacturer Vanderbilt Minerals, LLC
30 Winfield Street
Norwalk, CT 06855

1-203-295-2140
Chemtrec: 1-800-424-9300
Outside US: +1-703-527-3887

Chemical name 38% 1,10-Phenanthroline in n-butanol and 2-ethylhexanoic acid.

Synonym Not available.

Material uses Paint and Coating Additive.

Code 00108

2 . Hazards identification

Physical state Liquid.

Color Amber to Brown.

Odor Alcohol-like. [Slight]

Emergency overview

WARNING!
FLAMMABLE LIQUID AND VAPOR.
HARMFUL IF SWALLOWED.
CAUSES EYE AND SKIN IRRITATION.

Contains material which causes damage to the following organs: kidneys, the nervous system, liver.
Contains material which may cause damage to the following organs: mucous membranes, upper respiratory tract, skin, eyes, central nervous system (CNS).

Do not ingest. Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing.

Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Routes of entry Dermal contact. Eye contact. Inhalation. Ingestion.

See toxicological information (Section 11)

3 . Composition/information on ingredients

Name	CAS no.	% by weight
n-butanol	71-36-3	52
1,10-phenanthroline	66-71-7	38
2-ethylhexanoic acid	149-57-5	10

4 . First aid measures

Eye contact Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

4 . First aid measures

Inhalation

Get medical attention immediately. Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Ingestion

Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Notes to physician

In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Medical conditions aggravated by over-exposure

Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

5 . Fire-fighting measures

Flammability of the product

Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

Extinguishing media

Suitable

Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable

Do not use water jet.

Special exposure hazards

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Hazardous thermal decomposition products

Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Special remarks on explosion hazards

Vapors of n-butanol may be explosive when mixed with air.

6 . Accidental release measures

Personal precautions

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

6 . Accidental release measures

Environmental precautions Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Handling Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
n-butanol	**OSHA (United States, 1994). Absorbed through skin.** TWA: 50 ppm CEIL: 50 ppm **ACGIH (United States, 1994). Absorbed through skin.** CEIL: 50 ppm CEIL: 152 mg/m³ **RQMT (United States, 1994). Absorbed through skin.** STEL: 150 ppm CEIL: 152 ppm **OSHA (United States, 1989). Absorbed through skin.**

8 . Exposure controls/personal protection

	CEIL: 150 mg/m³ **ACGIH TLV (United States, 2/2010).** TWA: 20 ppm 8 hours. **NIOSH REL (United States, 6/2009). Absorbed through skin.** CEIL: 150 mg/m³ CEIL: 50 ppm **OSHA PEL (United States, 6/2010).** TWA: 300 mg/m³ 8 hours. TWA: 100 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989). Absorbed through skin.** CEIL: 150 mg/m³ CEIL: 50 ppm
1,10-phenanthroline	**OSHA PEL (United States).** TWA: 5 ppm, (Respirable) **ACGIH TLV (United States).** TWA: 10 ppm, (Total dust) **NIOSH REL (United States).** TWA: 25 ppm, (Respirable)
2-ethylhexanoic acid	**ACGIH TLV (United States, 2/2010).** TWA: 5 mg/m³ 8 hours. Form: Inhalable fraction

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: Vapor and dust respirator.

Hands

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: Protective gloves should be worn under normal conditions of use.

Eyes

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Recommended: splash goggles

Skin

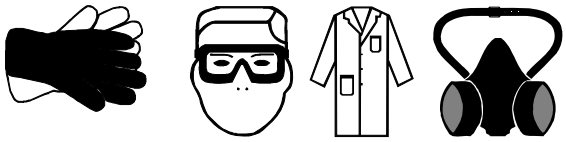
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Recommended: lab coat

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

8 . Exposure controls/personal protection

Personal protective equipment (Pictograms)



9 . Physical and chemical properties

Physical state	Liquid.
Color	Amber to Brown.
Odor	Alcohol-like. [Slight]
pH	Not available.
Boiling/condensation point	Not available.
Melting/freezing point	Not available.
Flash point	Closed cup: 36°C (96.8°F)
Auto-ignition temperature	Not available.
Vapor pressure	Not available.
Density	0.94 to 0.96 g/cm³ [25°C (77°F)]
Relative density	0.94 to 0.96
Solubility	Very slightly soluble in the following materials: cold water.
Partition coefficient: n-octanol/water	Not available.
Viscosity	Not available.
Vapor density	Not available.
Volatility	52% (v/v)
Evaporation rate	Not available.

10 . Stability and reactivity

Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Materials to avoid	Reactive or incompatible with the following materials: oxidizing materials
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Incompatibility with various substances	Highly reactive or incompatible with the following materials: oxidizing materials and acids. Reactive or incompatible with the following materials: metals.
Conditions of reactivity	Vapors of n-butanol may be explosive when mixed with air.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
n-butanol	LD50 Dermal	Rabbit	3400 mg/kg	-
	LD50 Oral	Mouse	2680 mg/kg	-
	LD50 Oral	Rat	790 mg/kg	-
	LC50 Inhalation Vapor	Rat	8000 ppm	4 hours
ACTIV-8®	LD50 Dermal	Rabbit	440 mg/kg	-
	LD50 Oral	Rat	257 mg/kg	-

Conclusion/Summary Eye irritation - 39-55/110 Draize

Chronic toxicity

Conclusion/Summary Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
n-butanol	Eyes - Severe irritant	Rabbit	-	-	-
	Skin - Moderate irritant	Rabbit	-	-	-
2-ethylhexanoic acid	Eyes - Severe irritant	Rabbit	-	-	-
	Skin - Mild irritant	Rabbit	-	-	-

Conclusion/Summary Not available.

Sensitizer

Conclusion/Summary Not available.

Carcinogenicity

Conclusion/Summary Not available.

Mutagenicity

Conclusion/Summary Not available.

Teratogenicity

Conclusion/Summary Teratogenic NOAEL 250 mg/kg (2-ethylhexanoic acid)

2-ethylhexanoic acid and n-butanol are reported to cause reproductive/teratogenic effects in laboratory animals.

Reproductive toxicity

Conclusion/Summary Not available.

12 . Ecological information

Environmental effects May cause long-term adverse effects in the aquatic environment.

Aquatic ecotoxicity

Conclusion/Summary Not available.

Biodegradability

Conclusion/Summary Not available.

Other adverse effects No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal

The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

RCRA classification

D001 [Ignitable]

Disposal should be in accordance with applicable regional, national and local laws and regulations.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	1992	Flammable Liquid, Toxic, n.o.s. (n-butanol, 1, 10-phenanthroline) RQ(n-butanol)	3 (6.1)	III		**Reportable quantity** 9615.4 lbs / 4365.4 kg [1213.9 gal / 4595.1 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements. **Remarks** Marine pollutant
TDG Classification	1992	Flammable Liquid, Toxic, n.o.s. (n-butanol, 1, 10-phenanthroline)	3 (6.1)	III		**Remarks** Marine pollutant

14 . Transport information

ADR/RID Class	1992	Flammable Liquid, Toxic, n.o.s. (n-butanol, 1, 10-phenanthroline)	3 (6.1)	III		**Remarks** Marine pollutant
IMDG Class	1992	Flammable Liquid, Toxic, n.o.s. (n-butanol, 1, 10-phenanthroline)	3 (6.1)	III		**Remarks** Marine pollutant
IATA-DGR Class	1992	Flammable Liquid, Toxic, n.o.s. (n-butanol, 1, 10-phenanthroline)	3 (6.1)	III		**Remarks** Marine pollutant

PG* : Packing group

15 . Regulatory information

HCS Classification

Flammable liquid
Toxic material
Irritating material
Target organ effects

U.S. Federal regulations

TSCA 8(a) IUR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: n-butanol; 2-Ethylhexanoic Acid
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: n-butanol: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; 2-Ethylhexanoic Acid: Immediate (acute) health hazard, Delayed (chronic) health hazard

CERCLA: Hazardous substances.: n-butanol: 5000 lbs. (2270 kg);

SARA 313

Form R - Reporting requirements

Product name	CAS number	Concentration
n-butanol	71-36-3	52

15 . Regulatory information

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: The following components are listed: n-butanol
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: N-BUTYL ALCOHOL
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: The following components are listed: n-butanol
New Jersey Hazardous Substances: The following components are listed: n-BUTYL ALCOHOL; 1-BUTANOL; 2-ETHYLHEXANOIC ACID; HEXANOIC ACID, 2-ETHYL-
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: The following components are listed: 1-Butanol
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: 1-BUTANOL
Rhode Island Hazardous Substances: None of the components are listed.

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
2-ethylhexanoic acid	No.	Yes.	No.	No.

United States inventory (TSCA 8b): All components are listed or exempted.

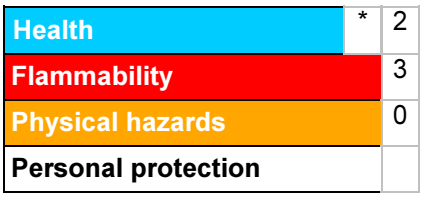
International regulations

International lists

Europe inventory: All components are listed or exempted.
Canada inventory: All components are listed or exempted.
Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

16 . Other information

Hazardous Material Information System (U.S.A.)



*** Chronic Potential**

16 . Other information

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Validation date	1/1/2013.
Print date	12/21/2012.
Date of previous issue	No previous validation.
Information contact	**Vanderbilt Global Services, LLC** **Corporate Risk Management** **1-203-295-2143**

Indicates information that has changed from previously issued version.

Visit www.vanderbiltminerals.com for more information.

Notice to reader

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