MATERIAL SAFETY DATA SHEET

Toluene

SECTION 1 . Product and Company Idenfication

Product Name and Synonym: Toluene

Product Code: T7606

Material Uses:

Manufacturer: Science Stuff
1104 Newport Ave
Austin, TX 78753
(512) 837-6020

Entry Date : 7/1/2013

Print Date: 7/1/2013

24 Hour Emergency Assistance : Chemtrec 800-424-9300
Canutec 613-996-6666

Health:	2
Flammability:	3
Reactivity:	0

Hazard Rating:

Least	Slight	Moderate	High	Extreme
0	1	2	3	4

NA=Not Applicable NE=Not Established

SECTION 2 HAZARD IDENTIFICATION

Keep away from heat and ignition sources. May be harmful if swallowed. Avoid breathing vapor or dust. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

SECTION 3 MIXTURE COMPONENTS

SARA 313	Component	CAS Number	Percent Comp.	Dimension	Exposure Limits
☑	Toluene	CAS# 108-88-3	100	V/V	OSHA TWA 200 ppm

SECTION 4 FIRST AID MEASURES

Keep away from heat and ignition sources. May be harmful if swallowed. Avoid breathing vapor or dust. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

FIRST AID: SKIN: In case of contact, immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. Thoroughly clean clothing and shoes before reuse. If symptoms persist, seek medical attention.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.

SECTION 5 FIRE FIGHTING MEASURES

Fire Extinguisher Type: Carbon Dioxide, dry chemical powder or appropriate foam

Fire / Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back.

Fire Fighting Procedure: Use water spray to cool fire exposed containers.

Extinguishing media

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.

Flammability of the product: flammable liquid, in a fire or if heated, a pressure increase will occur and the container my bust, with the risk of a subsequent explosion. The vapor/ gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion.

Hazardous thermal decomposition products: Decomposition products may include the following materials: carbon dioxide, carbon monoxide

Special protective equipment for firefighters: 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: Vapor may travel a considerable distance to source of ignition and flash back.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Eliminate ingition sources. Absorb spill with inert material, then place in a chemical waste container. Dispose of in a manner consistent with federal, local law.

Personal precautions: Use personal protective equipment. No action shall be taken involving any personal risk or without suitable training. Ensure adequate ventilation. Evacuate personnel to safe areas. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or5 flames in hazard area. Do not breathe vapor or mist.

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: Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

SECTION 7 HANDLING AND STORAGE

Store in a cool, dry, well-ventilated place away from incompatible materials. Wash thoroughly after handling.

Handling: 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 form a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks open flame or any other ignition souse. Use explosion-proof

electrical 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.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: NIOSH/MSHA-approved respirator

Ventilation

Local Exhaust ☐

Mechanical ☑

Protective Gloves: Wear appropriate gloves to prevent skin exposure

Eye Protection: Splash Goggles

Other Protective Equipment: Wear appropriate clothing to prevent skin exposure

Product name - United States – o-Toluene

Exposure limits

ACGIH TLV (United States, 1/2008)
TWA: 20 ppm 8 hour(s)
ACGIH TLV (United States, 1/2005). Absorbed through skin. Notes: 1996 Adoption Refers to Appendix A – Carcinogens.

OSHA PEL (1989 (United States, 3/1989)
TWA: 100 ppm 8 hour(s)
TWA: 375 mg/m3 8 hour(s)
STEL: 150 ppm 15 Minutes(s)
STEL: 560 mg/m3 15 minute(s)

NIOSH REL (United States, 6/2008)
TWA: 100 ppm 10 hour(s)
TWA: 375 mg/m3 10 hour(s)
STEL: 150 ppm 15 minute(s)
STEL: 560 mg/m3 15 minute(s)

NIOSH REL (United States, 12/2001).
STEL: 560 mg/m3 15 minute(s) Form: All forms
STEL: 150 ppm 15 minute(s) Form: All forms
TWA: 375 mg/m3 10 hour(s) Form: All forms
TWA: 100 ppm 10 hour(s) Form: All forms

OSHA PEL Z2(United States, 11/2006)
TWA: 200 ppm 8 hour(s)
CEIL: 300 ppm
AMP: 500 ppm 10 minute(s)

OSHA PEL Z2(United States, 8/1997)
TWA: 200 ppm 8 hour(s) Form: All forms
CEIL: 300 ppm Form: All forms
AMP: 500 ppm 10 minute(s) Form: All forms

ACGIH TLV (United States, 1/2005). Absorbed through skin. Notes: 1996 Adoption Refers to Appendix A – Carcinogens.
TWA: 188 mg/m3 8 hour(s). Form: All forms

TWA: 50 ppm 8 hour(s). Form: All forms

ACGIH TLV (United States, 1/2005). Absorbed through skin. Notes: 1996 Adoption Refers to Appendix A – Carcinogens.
OSHA PEL 1989 (United States, 3/1989). Notes: see table Z-2.
STEL: 560 mg/m3 15 minute(s). Form: All forms
STEL: 150 ppm 15 minute(s). Form: All forms
TWA: 375 mg/m3 8 hour(s). Form: All forms
TWA: 100 ppm 8 hour(s). Form: All forms

Engineering measurers: 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.

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.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Melting Point:	-139°F	Percent Volatile by Volume:	100%
Boiling Point:	231°F	Evaporation Rate	2.4
Vapor Pressure:	10mm Hg @ 70°F	Evaporation Standard	
Vapor Density:	3.18	Auto Ignition Temp	Information not available
Solubility in Water:	0.6mg / Liter	Lower Flamm. Limit in Air	1%
Appearance /Odors:	Colorless liquid, strong aromatic odor	Upper Flamm. Limit in Air	7%
Flash Point:	40°F		
Specific Gravity:	0.863		

SECTION 10 STABILITY AND REACTIVITY INFORMATION

Stability:	Stable
Conditions to Avoid:	Avoid contact with heat, sparks, flames, or other sources of ignition.

Materials to Avoid:	Strong oxidizers, metals, strong bases, amines
Hazardous Decomposition Products:	Toxic fumes of: Carbon Monoxide, Carbon Dioxide
Hazardous polymerization:	Will Not Occur
Conditions to Avoid:	None known

SECTION 11 Toxicological Information

Toxicity data

United States

Product/ingredient name – o-Toluene

Test	Route	Species	Result
LD50	Dermal	Rabbit	14100 uL/kg
LD50	Intraperitoneal	Rat	1332 mg/kg
LD50	Intravenous	Rat	1960 mg/kg
LD50	Oral	Rat	636mg/kg
LD50	Unreported	Rat	6900mg/kg
LDLo	Oral	Human	50mg/kg
LDLo	Intraperitoneal	Rat	2.5 mL/kg
TDLo	Oral	Rat	800 mL/kg
TDLo	Oral	Rat	1200 mg/kg
TDLo	Intraperitoneal	Rat	1 g/kg
TDLo	Intraperitoneal	Rat	750 mg/kg
TDLo	Intraperitoneal	Rat	900 mg/kg
TDLo	Intraperitoneal	Rat	600 mg/kg
TDLo	Oral	Rat	400 mg/kg
LC50	Inhalation Vapor	Rat	49 g/m3
LC50	Inhalation Vapor	Rat	49 mg/m3

Carcinogenicity

Classification

Product/ ingredient name	Toluene	ACGIH- A4	IARC-3	EPA	NIOSH	NTP	OSHA

No known sighificent effects or critical hazards.

Mutagenicity
No known sighificent effects or critical hazards.

Teratogenicity
No known sighificent effects or critical hazards.

SECTION 12 Ecological Information

Aquatic ecotoxicity

Product/ ingredient name
Toluene

Result	Species	Exposure
Acute EC50 6.78mg/L	Fish	48 hours
Acute EC50 6.56mg/L	Daphnia	48 hours
Acute EC50 6mg/L	Daphnia	48 hours
Acute EC50 6880 to 9830 ug/L fresh water	Daphnia-Water flea- Daphnia magna- Neonate	48 hours
Acute EC50 6780 to 7810 ug/L fresh water	Fish- Rainbow trout, donaldson trout- Oncorhynchus mykiss- Juvenile (Fledgling, Hatchling, Weanling -54mm - 2.187 g	96 hours
Acute EC50 6000 ug/L fresh water	Daphnia- Water flea Daphnia magna- Juvenile (Fledgling, Hatchling, Weanling)	48 hours
Acute EC50 19600ug/L fresh water	Daphnia- Water flea Daphnia magna- LARVAE	48 hours
Acute LC50 8110 ug/L fresh water	Fish- Coho salmon, Silver salmon- Oncorhynchus kisutch- 0.3g	96 hours

Acute LC50 8090 to 8780 ug/L Marina water	Fish- pink salmon- Oncorhynchus gorbuscha FRY- 3.5cm - 0.35g	96 hours
Acute LC50 7630 to 8480 ug/L Marina water	Fish- pink salmon- Oncorhynchus gorbuscha FRY- 3.5cm - 0.35g	96 hours
Acute LC50 12.6 mg/L	Fish	96 hours
Acute LC50 6.78 mg/L	Fish	96 hours
Acute LC50 6780 to 7810 ug/L fresh water	Fish- Rainbow trout donaldson trout- oncorhynchus mykiss- juvenile (fledgling, hatchling, weanling) 54 mm- 2.187g	96 house
Acute LC50 6410 to 7180 ug/L marina water	Fish- pink salmon- oncorhynchus gorbuscha- FRY- 3.5cm - 0.35g	96 hours
Acute LC50 5.8mg/L	Fish	96 hours
Acute LC50 5800ug/L fresh water	Fish- Rainbow trout donaldson trout- oncorhynchus mykiss	96 house
Acute LC50 5500 ug/L fresh water	Fish- Coho salmon silver salmon- oncorhynchus kisutch- FRY- 1g	96 hours
Acute LC50 9360 ug/L fresh water	Fish- Coho salmon silver salmon- oncorhynchus kisutch- FRY- > 90 days	96 hours
Acute LC50 310000 to 420000 ug/L fresh water	Daphnia- water flea- daphnia Daphnia magna- <24 hours	48 hours
Acute LC50 170000ug/L marina water	Crustaceans- dungeness or edible crab- cancer magister- Zoea	48 hours
Acute LC50 97700 to 174700 ug/L fresh water	Daphnia- water flea- daphnia Daphnia magna- neonate <= 24 hours	48 hours
Acute LC50 86300 to 174700 ug/L fresh water	Daphnia- water flea- daphnia Daphnia magna- neonate <= 24 hours	48 hours
Acute LC50 15.5 ppm marine water	Crustaceans- Daggerblade grass shrimp- Palaemonetes pugio- adult	48 hours
Acute LC50 15500 ug/L marine water	Crustaceans- Daggerblade grass shrimp- Palaemonetes pugio	48 hours
Acute LC50 7.3 ul/L marina water	Fish- Striped bass- morone saxatilis- juvenile (fledgling, hatchling, weanling) - 6g	96 hours

Environmental effects : No known sighificant effects or critical hazards.
Other adverse effects : No known sighificant effects or critical hazards.

SECTION 13 Disposal Considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14 Transport Information

DOT (US)
UN-Number: UN1294 Class: 3 Packing group: II
Proper shipping name: TOLUENE
Reportable Quantity: 1000lbs. (454 kg)

DOT Classification: UN1294, Toluene, 3, PG II

DOT Regulations may change from time to time. Please consult the most recent D.O.T. regulations.

SECTION 15 Regulatory Information

United States

HCS Classification:

Flammable liquid
Highly toxic material
Irritating material
Target organ effects

U.S. Federal regulations:

United States inventory (TSCA 8b): This material is listed or exempted
TSCA8 (d) H and S data reporting: Toluene : 1982
TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notifications: No products were found.
SARA 302/304/311/312 hazardous chemicals: Toluene
SARA 311/312 MSDS distribution- Chemical inventory- hazard identification: Toluene: Fire hazard, immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 307: Toluene
Clean Water Act (CWA) 311: Toluene
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substance: No products were found.
Clean Air Act (CAA) 112 regulated toxic substance: No products were found.

DEA List I Chemicals : not listed
(Precursor Chemicals)
DEA List II Chemicals : listed
(essential Chemicals)

SARA 313
Form R – Reporting : Toluene CAS number : 108-88-3 Concentration : 100
Requirements
Supplier notification : Toluene CAS number : 108-88-3 Concentration : 100

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.
Massachusetts Substance : This material is listed.
New Jersey Hazardous Substances : This material is listed.
New York Acutely Hazardous Substances : This material is listed.
Pennsylvania RTK Hazardous Substances : This material is 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: Toluene Cancer: No Reproductive: Yes No significant risk level: no
Maximum acceptable dosage level: 7000 ug/day (ingestion) 13000 ug/day (inhalation)

Canada
WHMIS (Canada) : Class B-2 : Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists : CEPA Toxic Substance: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is not listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

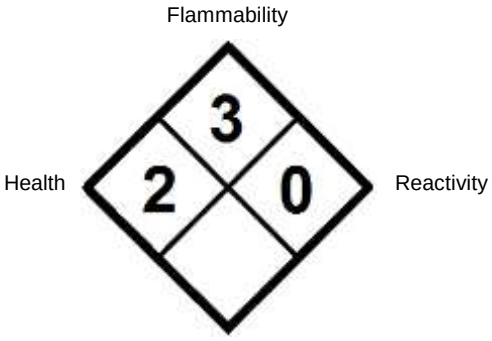
CEPA DSL/ CEPA NDSL : this material is listed or exempted.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

EU regulations:
Risk phrases: R11- Highly Flammable.
R63- Possible risk of harm to the unborn child.
R48/20- harmful: danger of serious damage to health by prolonged exposure through inhalation.
R65- harmful: may cause lung damage if swallowed.
R38- irritating to skin
R67- vapors may cause drowsiness and dizziness

Safety phrases: S2- keep out the reach of children.
S36/37- Wear suitable protective clothing and gloves.
S46- If swallowed, seek medical advice immediately and show this container or label
S62 – if swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

International regulations
International lists: Australia inventory (AICS): This material is listed or exempted.
China inventory (IECSC): This material is listed or exempted.
Japan inventory (ENCS): This material is listed or exempted.
Japan inventory (ISHL): Not determined.
Korea inventory (KECI): This material is listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted.
Philippians inventory (PICCS): This material is listed or exempted.

SECTION 16 Additional Information



NFPA

Revisions

0.1	Creation date LS

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