Kinetics Hybrid Electric System

Emergency Response Guide

Note – This system is installed in Class 3 – 7 Heavy Duty Buses and Trucks as either a Hybrid Retrofit or in New Production Vehicles. Unlike production car hybrids, this system is not limited to a specific model or manufacturer.

Typical Hybrid Vehicle Applications

About This Guide:

This First Responder Guide for the Crosspoint Kinetics Hybrid Drive System is intended to enhance safety by:

- Assisting Kinetics Hybrid identification
- Outlining Kinetics Hybrid Safety Features
- Illustrating typical component locations
- Explaining the ultracapacitor energy storage
- Outlining recommended emergency response tactics for various scenarios
- Providing additional MSDS and phone assistance information
- For additional technical assistance, please contact us at **CustomerCare@crosspointkinetics.com** or at (855)-435-4301 - Eastern time zone

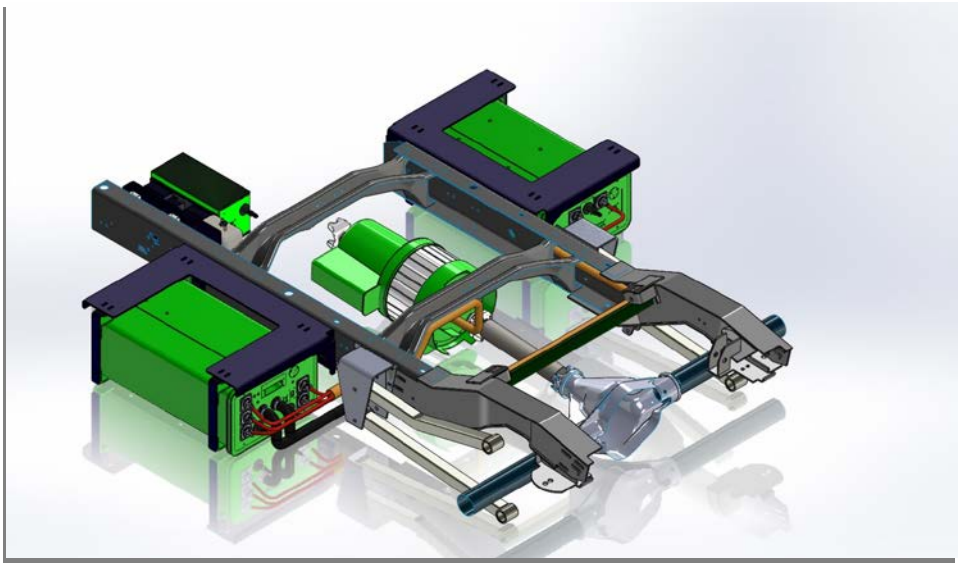
Thank you for taking time to study this guide and enhance your preparedness with the new trend in hybrid electric vehicles!

REVISION RECORD						
REV	DCN	DESCRIPTION	BY	CHECKED	APPROVED	DATE
01	CN 0027	Initial Release	FJ		WAB	03/08/13
02	CN 0072	Update	FJ		WAB	11/21/14

Printed versions of this document are not controlled

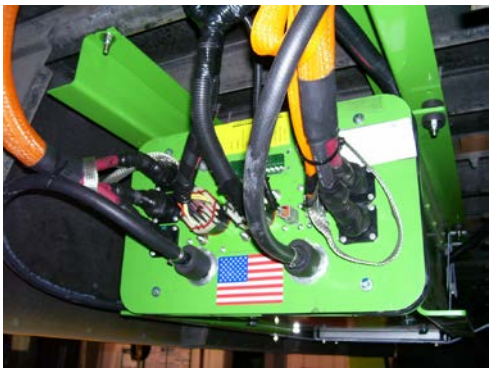
Table of Contents

	Page
Cover	1
About this Guide	2
Table of Contents	3
Kinetics hybrid characteristics, Identification	4
Kinetics safety features	5
Typical hybrid component locations	7
What is inside an ultra capacitor?	8
Emergency Response	9
Collision – Extrication	9
Fire	10
` Spills – First Aid	11
Submersion	11
Roadside Assistance and towing	12
Ultra capacitor electrolyte MSDS	13 – 18



Kinetics hybrid characteristics, Identification

1. Why is a hybrid electric system different?
    a. Storage of braking energy as electricity
    b. Electric motor used to boost acceleration using this energy to save fuel and emissions
    c. Provides a secondary drive system to the vehicle engine
2. How do you tell if the Crosspoint Kinetics hybrid system is installed - Identification?
    a. Vehicles have “Hybrid Electric Vehicle” signs on the sides and rear
    b. The hybrid motor / generator is always installed in the driveline (as part of the driveshaft) of a truck or bus – this is a bright safety green color
    c. The motor controller and energy storage are installed under the vehicle in a bright safety green color steel case
    d. ALL high voltage cables are in a bright orange wire loom
    e. Green / yellow hybrid driver panel installed on dash
3. Differences between the Crosspoint Kinetics Series 3000 and other hybrids:
    a. Most other hybrids store and operate on 200 – 500 Volts – This system uses 60 – 96 Volts for enhanced safety
    b. Most other electric hybrids store the electricity in high energy batteries – This system uses ultra capacitors that have limited energy storage and a rugged sealed case for increased safety
    c. The Crosspoint Kinetics system is installed on commercial vehicles such as school buses, transit buses and delivery trucks



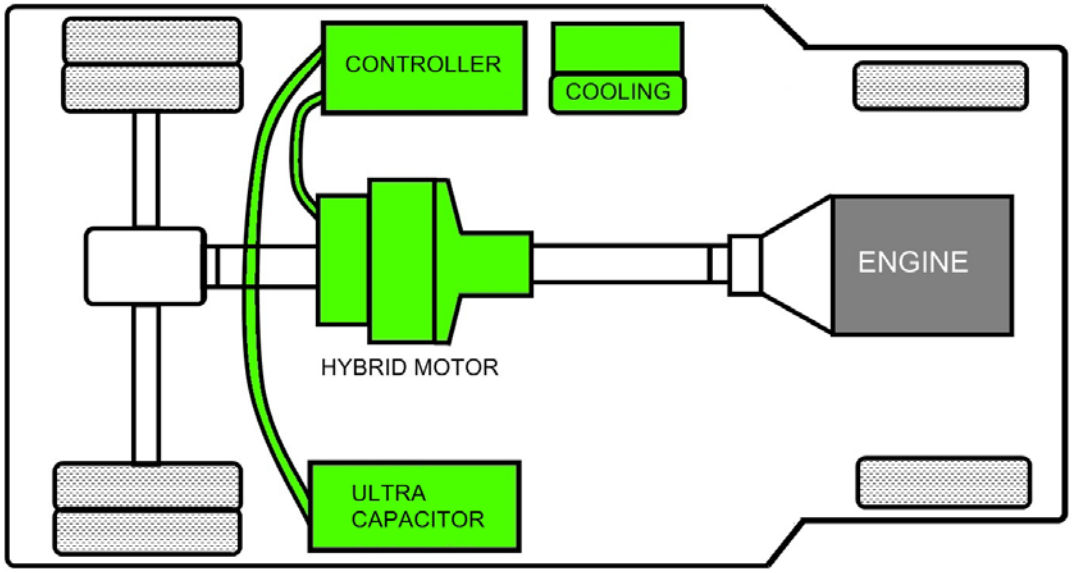
Kinetics Hybrid Safety Features:

- When the vehicle ignition is OFF, the hybrid system is always OFF and SAFE – Energy isolated inside the ultracapacitor housing
- The vehicle must be moving at ½ mph or higher speed for the hybrid to engage – the hybrid drive cannot move the rear wheels when the vehicle is stopped
- A Ground Fault Interrupter (GFI) is active whenever the ignition is ON. IF any high voltage leakage to the vehicle frame is detected, ALL contactors open to isolate and protect the system's stored energy
- In a crash or rollover, an inertia switch automatically disconnects the hybrid energy source
- The high voltage (+) supply cable contains a fuse that will open in the event of a high current short circuit
- The Crosspoint Kinetics hybrid system uses a lower voltage (60 – 96 Volts) than other hybrids (200 – 500 Volts) for increased safety
- Instead of batteries, the Crosspoint Kinetics hybrid system uses ultra capacitors with limited energy storage that are contained in a rugged sealed aluminum inner housing and a steel outer housing.
- This hybrid system is powered solely by conserving vehicle braking energy – it is never plugged into a charger or high voltage receptacle
- If the ignition cannot be turned OFF, pushing IN a red palm button located on the ultra capacitor housing front panel will disconnect and isolate the high voltage energy source
- ALL cables and wiring that can contain high voltage are covered with a safety orange covering and protected with an internal copper shielding braid covering
- The Kinetics hybrid system was approved by the Indiana Dept. of Education and Indiana State Police for retrofit into school buses on Jan. 25, 2008

Typical hybrid component locations:

- Motor / Generator – Cylindrical safety green housing in the drive shaft between the transmission and the rear axle
- Ultra capacitor energy storage – in a safety green rectangular housing under the vehicle floor – usually between the frame rail and skirt
- Hybrid controller – in a safety green rectangular housing under the vehicle floor – usually between the frame rail and skirt
- DC Cables – In safety orange wire loom, between the energy storage and hybrid controller (60-96 V. DC when ignition is ON)
- Motor cables - In safety orange wire loom, between the motor / generator and hybrid controller (60-96 V. AC only when the wheels or driveshaft is turning)
- Cooling module – Shoe box sized housing providing dedicated hybrid cooling with standard automotive water/ glycol antifreeze – usually located next to hybrid controller under the vehicle floor

Parallel Hybrid Drive System Post Transmission



What is inside an ultra capacitor?

Maxwell Ultra Capacitor module (2 or 4 per hybrid)

- Organic materials hermetically sealed in a rugged aluminum case
- 65% Activated carbon (Ground coconut shells) and aluminum conductors
- 35% electrolyte – consisting of acetonitrile solvent and a salt – this solvent is a class 3 flammable material similar to acetone – nail polish remover – DOT Material UN 1684 – See MSDS pgs. 13-17
- Only 3% of the electrolyte is free material – the rest is absorbed into the activated carbon
- Because 97% of the electrolyte is absorbed in the carbon matrix, fluid spill is not normally a concern unless the modules are crushed
- Note that if the ultracapacitor is crushed or leaks the electrolyte, avoid contact or breathing of this liquid, since this contains cyanide – see the emergency response section and MSDS for more information
- Over voltage or over heating of the ultra capacitor usually causes an open circuit, dissipating the stored voltage
- As with many organic materials and plastics, burning of the carbon and electrolyte with insufficient oxygen can produce CO (carbon monoxide) and HCN (Hydrogen Cyanide) gasses that are poisonous
- In case of fire, use water spray (fog), foam, dry chemicals, or CO 2.
- Ultra capacitor modules are on rubber vibration mounts and sealed inside a steel case

EMERGENCY RESPONSE

- On arrival, emergency responders should follow their standard operating procedures for vehicle incidents
- For the safety of all personnel, always treat the hybrid system as if it is ON – until this is proven to be SAFE
- During emergency situations, remember that the Crosspoint Kinetics hybrid system is OFF and SAFE whenever the vehicle ignition is OFF.
- IF the vehicle has an impact, the impact sensor opens and the hybrid may be OFF and SAFE, but this should be verified
- If the Ground Fault Interrupter (GFI) senses electrical leakage to the vehicle frame, it will automatically open protective contactors and the hybrid will be OFF and SAFE.
- If the ignition cannot be turned OFF, press IN the red palm button on the ultracapacitor front panel and this will make the hybrid OFF and SAFE

EMERGENCY RESPONSE – Collision – Extrication

- When approaching the vehicle, look for any signs of leakage or damage. The hybrid coolant is standard auto antifreeze. If the green ultracapacitor case is crushed (with red palm button on panel), look for any leakage of a clear solvent like electrolyte. CAUTION- if capacitor electrolyte leakage is found, avoid contact or breathing. This solvent (DOT Material UN 1684 – Acetonitrile) is both FLAMABLE AND TOXIC – contains cyanide
- Use of Self Contained Breathing Apparatus (SCBA) is strongly advised
- Immobilize the vehicle -
    - Chock the drive wheels & set the parking brake
    - Shift transmission into park or neutral
- Disable the vehicle - Turn OFF the vehicle ignition or press IN the red palm button to disable the hybrid system and make it OFF and SAFE
- If extrication is needed, avoid crushing the safety green ultracapacitor housing – identified by the RED Palm Button on its front panel and the single orange covered cable
- DO NOT cut into any ORANGE covered cables – they may contain high voltage
- If necessary, locate and disconnect the 12 V battery in the vehicle. Loss of 12V DC power makes the hybrid system OFF and SAFE.

EMERGENCY RESPONSE – Fire

- Use of Self Contained Breathing Apparatus (SCBA) should be used for fighting any vehicle fire because of the toxic smoke that can be produced
- Ultracapacitors store a limited amount of energy when compared to batteries and Kinetics ultracaps are contained in a much more robust steel and aluminum protective housing
- The Crosspoint Kinetics hybrid voltage of 55-96 VDC WILL NOT follow water back up a fire hose and cause a shock to a fire fighter
- Ultracapacitors contain 35% electrolyte consisting of acetonitrile solvent and a salt. This solvent is a class 3 Flammable liquid and is toxic. It is similar to acetone- DOT material UN 1648 – ACETONITRILE – see MSDS pgs. 12-16
- When approaching the vehicle, look for any signs of leakage or damage. The hybrid coolant is standard auto antifreeze. If the green ultracapacitor case is crushed (with red palm button on panel), look for any leakage of a clear solvent like electrolyte. CAUTION- if capacitor electrolyte leakage is found, avoid contact or breathing. This solvent (DOT Material UN 1684 – Acetonitrile) is both FLAMMABLE AND TOXIC – contains cyanide
- See the enclosed MSDS for fire fighting guidelines and CHEMTREC toll free phone # 1- 800-424 -9300
- Disable the vehicle - Turn OFF the vehicle ignition or press IN the red palm button to disable the hybrid system and make it OFF and SAFE. Within five seconds, the voltage in the orange cables has been dissipated
- If extrication is needed, avoid crushing the safety green ultracapacitor housing – identified by the RED Palm Button on its front panel
- DO NOT cut into any ORANGE covered cables – they may contain high voltage
- If necessary, locate and disconnect the 12 V battery in the vehicle. Loss of 12V DC power makes the hybrid system OFF and SAFE.
- The ultracapacitor cells are contained inside a thick wall aluminum gasketed housing as a module. The modules are rubber vibration mounted and contained inside a galvanized steel housing
- Testing by Maxwell Technologies (ultracapacitor mfg.) has shown that in a fuel fed fire ultracapacitor modules resist the fire twice as long as batteries and then dissipate their electrical energy internally

EMERGENCY RESPONSE – Spills – First Aid

- When approaching the vehicle, look for any signs of leakage or damage. The hybrid coolant is standard auto antifreeze. If the green ultracapacitor case is crushed (with red palm button on panel), look for any leakage of a clear solvent like electrolyte. CAUTION- if capacitor electrolyte leakage is found, avoid contact or breathing. This solvent (DOT Material UN 1684 – Acetonitrile) is both FLAMMABLE AND TOXIC – contains cyanide.
- Use of Self Contained Breathing Apparatus (SCBA) is required
- Remove people in contact with electrolyte through skin contact or breathing to fresh air, follow MSDS guidelines – pgs. 12-16
- See the enclosed MSDS for spill and first aid guidelines - CHEMTREC toll free phone # 1- 800-424 -9300
- If the electrolyte is present outside the housing, note the low flash point of 46 F. Avoid ignition sources and static sparks
- The electrolyte can be absorbed into the skin, lungs and eyes and can produce cyanide compounds in the body – similar to urethane paint and foam components – wear full protective gear to avoid contact

EMERGENCY RESPONSE – Submersion

- The double sealed steel housing and gasketed aluminum shell of the ultracapacitor modules provides multiple protection in a submersion / immersion situation
- The Ground Fault Interrupter (GFI) is active whenever the ignition is ON. If any high voltage leakage to the frame is detected, ALL contactors will open to isolate and protect the systems stored energy.
- In a crash or rollover, an inertia switch opens to automatically disconnect the hybrid energy source
- The Kinetics hybrid uses a lower voltage (55 – 96 Volts) that other hybrids (300 – 500 volts) for increased safety
- When the vehicle ignition is OFF, the hybrid system is always OFF and SAFE – energy is isolated inside the ultracapacitor housing

Roadside Assistance and Towing –

- If the hybrid is acting erratically or is displaying a continuous RED light on the driver panel, turn the control switch to OFF. This will disable the hybrid and decouple the hybrid magnets inside the motor to eliminate drag. The trip can then be continued using the vehicle engine until hybrid service can be obtained. This fail safe feature insures continued passenger service.
- Vehicles with the Crosspoint Kinetics hybrid system should not be towed at highway speeds with the rear wheels on the ground and the drive shaft rotating.
- Highway towing with the rear wheels raised is OK
- Use of tow dollies to support the rear wheels is OK
- If the vehicle must be towed at highway speeds with the rear wheels on the ground, the rear drive shaft (between the hybrid motor and rear axle) MUST be removed
- WARNING – towing with the rear wheels down and the hybrid rotating voids the warranty and can generate excessive heat and voltages inside the hybrid motor.

Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Acetonitrile MSDS

Section 1: Chemical Product and Company Identification

Product Name: Acetonitrile

Catalog Codes: SLA3625, SLA1279, SLA1942

CAS#: 75-05-8

RTECS: AL7700000

TSCA: TSCA 8(b) inventory: Acetonitrile

CI#: Not applicable.

Synonym: Methyl Cyanide

Chemical Name: Acetonitrile

Chemical Formula: CH3CN

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Acetonitrile	75-05-8	100

Toxicological Data on Ingredients: Acetonitrile: ORAL (LD50): Acute: 2460 mg/kg [Rat.]. 269 mg/kg [Mouse]. DERMAL (LD50): Acute: 1250 mg/kg [Rabbit.].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Severe over-exposure can result in death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. The substance is toxic to blood, kidneys, lungs, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS). The substance may be toxic to the reproductive system. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 524°C (975.2°F)

Flash Points: CLOSED CUP: 2°C (35.6°F). OPEN CUP: 5.6°C (42.1°F) (Cleveland).

Flammable Limits: LOWER: 4.4% UPPER: 16%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards: Store under nitrogen.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:

Flammable liquid. Poisonous liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, acids, alkalis, moisture.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 40 (ppm) from ACGIH (TLV) [United States] [1999] STEL: 60 from ACGIH (TLV) [United States] [1999] TWA: 20 (ppm) from NIOSH TWA: 40 STEL: 60 (ppm) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Liquid.)

Odor: Aromatic; Ether-like (Strong.)

Taste: Burning, sweetish

Molecular Weight: 41.05 g/mole

Color: Colorless.

pH (1% soln/water): 7 [Neutral.]

Boiling Point: 81.6 (178.9°F)

Melting Point: -46°C (-50.8°F)

Critical Temperature: Not available.

Specific Gravity: 0.783 (Water = 1)

Vapor Pressure: 9.7kPa (@ 20°C)

Vapor Density: 1.42 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol.

Solubility: Soluble in cold water, hot water, methanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, acids, alkalis, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: High dielectric constant; high polarity; strongly reactive.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 269 mg/kg [Mouse]. Acute dermal toxicity (LD50): 1250 mg/kg [Rabbit.]. Acute toxicity of the vapor (LC50): 7551 8 hours [Rat.].

Chronic Effects on Humans:
DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. Causes damage to the following organs: blood, kidneys, lungs, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS). May cause damage to the following organs: the reproductive system.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Material is irritating to mucous membranes and upper respiratory tract.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 1020 mg/l 96 hours [Fish (Fathead Minnow)]. 1850 mg/l 96 hours [Fish (bluegill)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Acetonitrile UNNA: UN1648 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
New York release reporting list: Acetonitrile Rhode Island RTK hazardous substances: Acetonitrile Pennsylvania RTK: Acetonitrile Florida: Acetonitrile Minnesota: Acetonitrile Massachusetts RTK: Acetonitrile New Jersey: Acetonitrile TSCA 8(b) inventory: Acetonitrile TSCA 8(a) PAIR: Acetonitrile TSCA 8(d) H and S data reporting: Acetonitrile: 1992 SARA 313 toxic chemical notification and release reporting: Acetonitrile CERCLA: Hazardous substances.: Acetonitrile: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. S16- Keep away from sources of ignition - No smoking. S27- Take off immediately all contaminated clothing. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

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

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la SantÃ© et de la SÃ©curitÃ© du Travail du QuÃ©bec. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du rÃ¯glement sur le transport des marchandises dangeureuses au canada. Centre de conformitÃ© internatinal LtÃ©e. 1986.

Other Special Considerations: Not available.

Created: 10/10/2005 08:35 PM

Last Updated: 11/01/2010 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express 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 purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.