

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

**SECTION 1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : Capping B (644)  
MSDS Number : 000000011335  
Product Use Description : Capping Reagent for DNA/RNA Synthesis

Company : Honeywell International Inc.  
1953 South Harvey Street  
Muskegon, MI 49442

For more information call : 1-800-368-0050  
(Monday-Friday, 9:00am-5:00pm)

**In case of emergency call : Medical: 1-800-498-5701**  
: **Transportation: 1-800-424-9300 or +1-703-527-3887**  
: (24 hours/day, 7 days/week)

**SECTION 2. HAZARDS IDENTIFICATION****Emergency Overview**

Form : liquid, clear

Color : colourless

Odor : sweet ether-like

Hazard Summary : Flammable. In use, may form flammable/explosive vapour-air mixture. Corrosive. Causes burns. May be harmful if inhaled. May be harmful if swallowed. May be harmful if absorbed through skin. Irritating to eyes, respiratory system and skin. May cause irritation of the gastrointestinal tract. Can cause fatal cyanide poisoning. May cause convulsions. Symptoms may be delayed. Can be absorbed through skin. Repeated exposure may cause skin dryness or cracking.

**Potential Health Effects**

Skin : Causes skin burns.  
May be harmful if absorbed through skin.  
Can cause fatal cyanide poisoning.  
Symptoms may be delayed.  
Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.

Eyes : Causes eye burns.  
Causes itching, burning, redness and tearing.

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

**Ingestion** : Ingestion causes burns of the upper digestive and respiratory tracts.  
Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.  
May cause systemic poisoning with symptoms paralleling those of inhalation.  
Can cause fatal cyanide poisoning.  
Symptoms may be delayed.

**Inhalation** : Inhaled corrosive substances can lead to a toxic oedema of the lungs.  
Inhalation of high vapour concentrations can cause CNS-depression and narcosis.  
Causes headache, drowsiness or other effects to the central nervous system.  
Can cause fatal cyanide poisoning.  
Symptoms may be delayed.

**Chronic Exposure** : Can cause fatal cyanide poisoning.  
Causes damage to the kidneys/liver/eyes/brain/respiratory system/central nervous system through prolonged or repeated exposure.  
Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.

**Aggravated Medical Condition** : People suffering from pre-existing thyroid conditions may experience adverse effects.  
Neurological disorders  
Heart disease  
Respiratory disorders  
Liver disorders  
Kidney disorders  
Skin disorders  
Eye disorders

**Target Organs** : Respiratory system  
Cardiovascular system  
Central nervous system  
Liver  
Kidney

**Carcinogenicity**

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

Component	CAS-No.	Weight %
Acetonitrile	75-05-8	44.00
2,6-Dimethylpyridine	108-48-5	31.00
Acetic anhydride	108-24-7	25.00

**SECTION 4. FIRST AID MEASURES**

- Inhalation : Call a physician immediately. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present.
- Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician immediately.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.
- Ingestion : Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician immediately.

**Notes to physician**

- Treatment : Treat as cyanide poisoning. Symptoms of poisoning may not appear for several hours. Keep under medical supervision for at least 48 hours.

**SECTION 5. FIRE-FIGHTING MEASURES**

- Flash point : 11 °C (52 °F)  
closed cup
- Lower explosion limit : not determined
- Upper explosion limit : not determined
- Suitable extinguishing media : Carbon dioxide (CO<sub>2</sub>)  
Dry chemical  
Alcohol-resistant foam  
Cool closed containers exposed to fire with water spray.
- Extinguishing media which : Do not use a solid water stream as it may scatter and spread

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

shall not be used for safety reasons

Specific hazards during fire fighting : fire.

: Flammable.  
 Vapours may form explosive mixtures with air.  
 Vapours are heavier than air and may spread along floors.  
 Vapors may travel to areas away from work site before igniting/flashing back to vapor source.  
 In case of fire hazardous decomposition products may be produced such as:  
 Hydrogen cyanide (hydrocyanic acid)  
 Carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), dense black smoke.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus and protective suit.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personal precautions : Wear personal protective equipment.  
 Immediately evacuate personnel to safe areas.  
 Keep people away from and upwind of spill/leak.  
 Ensure adequate ventilation.  
 Remove all sources of ignition.  
 Do not swallow.  
 Do not breathe vapours or spray mist.  
 Do not get in eyes, on skin, or on clothing.

Environmental precautions : Prevent further leakage or spillage if safe to do so.  
 Discharge into the environment must be avoided.  
 Do not flush into surface water or sanitary sewer system.  
 Prevent product from entering drains.  
 Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Methods for cleaning up : Ventilate the area.  
 No sparking tools should be used.  
 Use explosion-proof equipment.  
 Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13).

**SECTION 7. HANDLING AND STORAGE**
**Handling**

Handling : Wear personal protective equipment.  
 Use only in well-ventilated areas.  
 Keep container tightly closed.

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

Do not smoke.  
 Do not swallow.  
 Do not breathe vapours or spray mist.  
 Do not get in eyes, on skin, or on clothing.

Advice on protection against fire and explosion : Keep away from fire, sparks and heated surfaces.  
 Take precautionary measures against static discharges.  
 Ensure all equipment is electrically grounded before beginning transfer operations.  
 Use explosion-proof equipment.  
 Keep product and empty container away from heat and sources of ignition.  
 No sparking tools should be used.  
 No smoking.

**Storage**

Requirements for storage areas and containers : Store in area designed for storage of flammable liquids. Protect from physical damage.  
 Keep containers tightly closed in a dry, cool and well-ventilated place.  
 Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
 Keep away from heat and sources of ignition.  
 Keep away from direct sunlight.  
 Store away from incompatible substances.  
 Container hazardous when empty.  
 Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Engineering measures : Use with local exhaust ventilation.  
 Prevent vapor buildup by providing adequate ventilation during and after use.

Eye protection : Do not wear contact lenses.  
 Wear as appropriate:  
 Safety glasses with side-shields  
 If splashes are likely to occur, wear:  
 Goggles or face shield, giving complete protection to eyes

Hand protection : Solvent-resistant gloves  
 Gloves must be inspected prior to use.  
 Replace when worn.

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

- Skin and body protection** : Wear as appropriate:  
 Solvent-resistant apron  
 Flame retardant antistatic protective clothing  
 If splashes are likely to occur, wear:  
 Protective suit
- Respiratory protection** : In case of insufficient ventilation wear suitable respiratory equipment.  
 For rescue and maintenance work in storage tanks use self-contained breathing apparatus.  
 Use NIOSH approved respiratory protection.
- Hygiene measures** : When using, do not eat, drink or smoke.  
 Wash hands before breaks and immediately after handling the product.  
 Keep working clothes separately.  
 Remove and wash contaminated clothing before re-use.  
 Do not swallow.  
 Do not breathe vapours or spray mist.  
 Do not get in eyes, on skin, or on clothing.

**Exposure Guidelines**

Acetonitrile	75-05-8	ACGIH	TWA		20 ppm
		Skin designation: Can be absorbed through the skin.			
		NIOSH	REL	20 ppm	34 mg/m3
		US CA OEL	TWA PEL	40 ppm	70 mg/m3
		US CA OEL	STEL	60 ppm	105 mg/m3
		Skin designation: Can be absorbed through the skin.			
		OSHA Z1	PEL	40 ppm	70 mg/m3
		OSHA Z1A	TWA	40 ppm	70 mg/m3
		OSHA Z1A	STEL	60 ppm	105 mg/m3
Acetic anhydride	108-24-7	ACGIH	TWA		5 ppm
		NIOSH	Ceil_Time	5 ppm	20 mg/m3
		OSHA Z1	PEL	5 ppm	20 mg/m3
		OSHA Z1A	Ceiling	5 ppm	20 mg/m3

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

US CA OEL Ceiling 5 ppm 20 mg/m3

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Form	: liquid, clear
Color	: colourless
Odor	: sweet ether-like
pH	: not applicable
Melting point/range	: not determined
Boiling point/boiling range	: not determined
Vapor pressure	: not determined
Relative vapour density	: not determined
Density	: 0.881 g/cm3 at 20 °C (68 °F)
Water solubility	: completely soluble

**SECTION 10. STABILITY AND REACTIVITY**

Conditions to avoid	: Heat, flames and sparks. Keep away from direct sunlight. Protect against water. Protect from moisture.
Materials to avoid	: Acids Bases Water Alcohols Oxidizing agents Amines Reducing agents Sulfites Perchlorates May attack many plastics, rubbers and coatings.
Hazardous decomposition products	: In case of fire hazardous decomposition products may be produced such as: Hydrogen cyanide (hydrocyanic acid) Carbon dioxide (CO <sub>2</sub> ), carbon monoxide (CO), oxides of

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

nitrogen (NOx), dense black smoke.

Hazardous reactions : Hazardous polymerisation does not occur.  
Stable under normal conditions.

**SECTION 11. TOXICOLOGICAL INFORMATION**

Acute oral toxicity : LD50 rat  
Dose: 2,460 mg/kg  
Test substance: Acetonitrile

Acute oral toxicity : LD50 rat  
Dose: 1,780 mg/kg  
Test substance: Acetic anhydride

Acute oral toxicity : LD50 rat  
Dose: 457 mg/kg  
Test substance: 2,6-Dimethylpyridine

Acute dermal toxicity : LD50 rabbit  
Dose: > 2,000 mg/kg  
Test substance: Acetonitrile

Acute dermal toxicity : LD50 rabbit  
Dose: 4,332 mg/kg  
Test substance: Acetic anhydride

Acute dermal toxicity : LD50 rabbit  
Dose: > 1,000 mg/kg  
Test substance: 2,6-Dimethylpyridine

Acute inhalation toxicity : LC50 rat  
Dose: 7551 ppm  
Exposure time: 8 h  
Test substance: Acetonitrile

Acute inhalation toxicity : LC0 rat  
Dose: 4.18 mg/l  
Exposure time: 4 h  
Test substance: Acetic anhydride

Acute inhalation toxicity : LC100 rat  
Dose: 8.36 mg/l  
Exposure time: 4 h  
Test substance: Acetic anhydride

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

**SECTION 12. ECOLOGICAL INFORMATION**

Toxicity to fish	:	flow-through test LC50 Species: Pimephales promelas (fathead minnow) Dose: 1,640 mg/l Exposure time: 96 h Test substance: Acetonitrile
Toxicity to fish	:	LC50 Species: Leuciscus idus (Golden orfe) Dose: 265 mg/l Exposure time: 48 h Test substance: Acetic anhydride
Toxicity to daphnia and other aquatic invertebrates.	:	LC50 Species: Daphnia magna (Water flea) Dose: 55 mg/l Exposure time: 24 h Test substance: Acetic anhydride
Toxicity to algae	:	Cell multiplication inhibition test Species: Scenedesmus quadricauda Dose: 3,400 mg/l Exposure time: 8 d Test substance: Acetic anhydride

**SECTION 13. DISPOSAL CONSIDERATIONS**

Waste Information: Observe all Federal, State, and Local Environmental regulations.

**SECTION 14. TRANSPORT INFORMATION**

<b>DOT</b>	UN-Number	:	2924
	Proper shipping name	:	Flammable liquid, corrosive, n.o.s. (Acetonitrile , Acetic anhydride )
	Class		3
	Packing group		II
	Hazard Label		3 (8)
<b>IATA</b>	UN Number	:	2924
	Description of the goods	:	Flammable liquid, corrosive, n.o.s. (Acetonitrile, Acetic anhydride)

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

)  
 Class : 3  
 Packaging group : II  
 Hazard Label : 3 (8)  
 Packing instruction (cargo aircraft) : 307  
 Packing instruction (passenger aircraft) : 305  
 Packing instruction (passenger aircraft) : Y305

**IMDG** Substance No. : UN 2924  
 Description of the goods : Flammable liquid, corrosive, n.o.s.  
 (ACETONITRILE  
 , ACETIC ANHYDRIDE  
 )  
 Class : 3  
 Packaging group : II  
 Hazard Label : 3 (8)  
 EmS Number : F-E  
 Marine pollutant : no

**SECTION 15. REGULATORY INFORMATION**
**Inventories**

EU. EINECS : On the inventory, or in compliance with the inventory

US. Toxic Substances Control Act : On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133) : All components of this product are on the Canadian DSL list.

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

Korea. Toxic Chemical Control Law (TCCL) List : On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory

TSCA 12B : US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

Acetonitrile 75-05-8

**National regulatory information**

US. Drug Enforcement Administration (DEA) Listed Precursor and Essential Chemicals (21 CFR 1310) : On the United States Drug Enforcement Authority (DEA) List of Precursors and Essential Chemicals

Acetic anhydride 108-24-7

**SARA 313 Components** : Acetonitrile 75-05-8

**SARA 311/312 Hazards** : Fire Hazard  
Acute Health Hazard  
Chronic Health Hazard

**CERCLA Reportable Quantity** : 11364 lbs

**California Prop. 65** : WARNING! This product contains a chemical known in the State of California to cause cancer.  
Acrylonitrile 107-13-1

**Massachusetts RTK** : Acetonitrile 75-05-8  
Acetic anhydride 108-24-7

**New Jersey RTK** : Acetonitrile 75-05-8  
Acetic anhydride 108-24-7

**Pennsylvania RTK** : Acetonitrile 75-05-8  
Acetic anhydride 108-24-7

**WHMIS Classification** : B2  
E  
D1A  
D2B

**Capping B (644)**

Version 1

Revision Date 10/30/2008

Print Date 10/30/2008

**SECTION 16. OTHER INFORMATION**

	<b>HMIS III</b>	<b>NFPA</b>
Health Hazard	: 3*	3
Flammability	: 3	3
Physical Hazard	: 0	
Instability	:	0

**Further information**

\* - Chronic health hazard