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Rotterdam Convention on the Prior Informed
Consent Procedure for Certain Hazardous
Chemicals and Pesticides in International Trade
Chemical Review Committee
Second meeting
Geneva, 13–17 February 2006
Item 5 (b) of the provisional agenda*

**Inclusion of chemicals in Annex III of the Rotterdam Convention:
review of notifications of final regulatory actions to ban
or severely restrict a chemical: DBCP**

DBCP: supporting documentation provided by Thailand

Note by the secretariat

The annex to the present note contains the supporting documentation provided by Thailand in support of its final regulatory action on DBCP.

* UNEP/FAO/RC/CRC.2/1.

Annex

List of supporting documentation on DBCP from Thailand

- Hazardous substance Factsheet: DBCP (New Jersey Department of Health and Senior Services)
 - Health Effects- Reproductive Toxicants (SCORECARD. The pollution information site)
 - Health Effect Carcinogens. (SCORECARD. The pollution information site)
 - 1,2- Dibromo-3-Chloropropane (DBCP) Air Toxic Website:- US- EPA
-



New Jersey Department of Health and Senior Services

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **DBCP**

CAS Number: 96-12-8
DOT Number: UN 2872

RTK Substance number: 0595
Date: March 1992 Revision: June 1998

HAZARD SUMMARY

- * DBCP can affect you when breathed in and by passing through your skin.
- * DBCP is a **CARCINOGEN**--HANDLE WITH EXTREME CAUTION.
- * DBCP may cause reproductive damage.
- * DBCP can irritate the eyes and skin.
- * Breathing DBCP can irritate the nose and throat causing coughing and wheezing.
- * Exposure to DBCP can cause headache, nausea, weakness, lightheadedness, passing out and even death.
- * Liver and kidney damage can result from high or repeated lower exposures.

IDENTIFICATION

DBCP is a dense yellow or amber liquid with a strong odor. It is used as a soil fumigant and in making other chemicals.

REASON FOR CITATION

- * DBCP is on the Hazardous Substance List because it is regulated by OSHA and cited by DOT, NIOSH, NTP, EPA, HHAG, DEP, and IARC.
- * This chemical is on the Special Health Hazard Substance List because it is a **CARCINOGEN**.
- * Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information and training concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard, 1910.1200, requires private employers to provide similar training and information to their employees.

- * Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.20.
- * If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) is 1 ppb averaged over an 8-hour workshift.

- * The above exposure limit is for air levels only. When skin contact also occurs, you may be overexposed, even though air levels are less than the limit listed above.
- * DBCP is a **PROBABLE CARCINOGEN** in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.

WAYS OF REDUCING EXPOSURE

- * Enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
- * A regulated, marked area should be established where DBCP is handled, used, or stored.
- * Wear protective work clothing.
- * Wash thoroughly immediately after exposure to DBCP and at the end of the workshift.
- * Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of DBCP to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to DBCP:

- * DBCP can irritate the eyes and skin.
- * Breathing DBCP can irritate the nose and throat causing coughing and wheezing.
- * Exposure to DBCP can cause headache, nausea, vomiting, weakness, lightheadedness, passing out and even death.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to DBCP and can last for months or years:

Cancer Hazard

- * DBCP is a PROBABLE CARCINOGEN in humans. It has been shown to cause stomach, breast, tongue and nasal cavity cancer in animals.
- * Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard

- * DBCP may damage the testes (male reproductive glands).
- * DBCP may decrease fertility in males and females. Infertility and lack of sex drive have been noted in exposed males. These effects appear to be reversible.

Other Long-Term Effects

- * Repeated exposure to DBCP can damage the eyes (clouding of lens or cornea).
- * Repeated skin contact can cause open sores.
- * Liver and kidney damage can result from high or repeated lower exposures.

MEDICAL

Medical Testing

Before beginning employment and at regular times after that, for those with frequent or potentially high exposures, the following are recommended:

- * Sperm counts.

If symptoms develop or overexposure is suspected, the following may also be useful:

- * Liver and kidney function tests.
- * Vision and eye examination.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

Mixed Exposures

- * Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.
- * Because more than light alcohol consumption can cause liver damage, drinking alcohol may increase the liver damage caused by DBCP.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

- * Where possible, automatically pump liquid DBCP from drums or other storage containers to process containers.
- * A Class I, Type B, biological safety hood should be used when mixing, handling, or preparing DBCP.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

- * Workers whose clothing has been contaminated by DBCP should change into clean clothing promptly.
- * Do not take contaminated work clothes home. Family members could be exposed.

- * Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to DBCP.
- * Eye wash fountains should be provided in the immediate work area for emergency use.
- * If there is the possibility of skin exposure, emergency shower facilities should be provided.
- * On skin contact with DBCP, immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted DBCP, whether or not known skin contact has occurred.
- * Do not eat, smoke, or drink where DBCP is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

OSHA 1910.132 requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

- * Avoid skin contact with DBCP. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
- * All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Eye Protection

- * Wear splash-proof chemical goggles and face shield when working with liquid, unless full facepiece respiratory protection is worn.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

- * Where the potential exists for exposures over 1 ppb, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

HANDLING AND STORAGE

- * Prior to working with DBCP you should be trained on its proper handling and storage.
- * A regulated, marked area should be established where DBCP is handled, used, or stored.
- * DBCP is not compatible with CHEMICALLY ACTIVE METALS (such as POTASSIUM, SODIUM, MAGNESIUM and ZINC).
- * Store in tightly closed containers in a cool, well-ventilated area.
- * DBCP is corrosive to metals.
- * Sources of ignition, such as smoking and open flames, are prohibited where DBCP is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
- * A Class I, Type B, biological safety hood should be used when mixing, handling, or preparing DBCP.

QUESTIONS AND ANSWERS

- Q: If I have acute health effects, will I later get chronic health effects?
 A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.
- Q: Can I get long-term effects without ever having short-term effects?
 A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.
- Q: What are my chances of getting sick when I have been exposed to chemicals?
 A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.
- Q: When are higher exposures more likely?
 A: Conditions which increase risk of exposure include, physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).
- Q: Is the risk of getting sick higher for workers than for community residents?
 A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. Because of this, and because of exposure of children or people who are already ill, community exposures may cause health problems

- Q: Don't all chemicals cause cancer?
- A: No. Most chemicals tested by scientists are not cancer-causing.
- Q: Should I be concerned if a chemical causes cancer in animals?
- A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.
- Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?
- A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.
- Q: Can men as well as women be affected by chemicals that cause reproductive system damage?
- A: Yes. Some chemicals reduce potency or fertility in both men and women. Some damage sperm and eggs, possibly leading to birth defects.
- Q: Who is at the greatest risk from reproductive hazards?
- A: Pregnant women are at greatest risk from chemicals that harm the developing fetus. However, chemicals may affect the ability to have children, so both men and women of childbearing age are at high risk.

 The following information is available from:

New Jersey Department of Health and
 Senior Services
 Occupational Disease and Injury Services
 Trenton, NJ 08625-0360
 (609) 984-1863

Industrial Hygiene Information

Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation

If you think you are becoming sick because of exposure to chemicals at your workplace, you may call a Department of Health and Senior Services physician who can help you find the services you need.

Public Presentations

Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources

The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-2202.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A carcinogen is a substance that causes cancer.

The CAS number is assigned by the Chemical Abstracts Service to identify a specific chemical.

A combustible substance is a solid, liquid or gas that will burn.

A corrosive substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A fetus is an unborn human or animal.

A flammable substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The flash point is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

HHAG is the Human Health Assessment Group of the federal EPA.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A miscible substance is a liquid or gas that will evenly dissolve in another.

mg/m³ means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A mutagen is a substance that causes mutations. A mutation is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NAERG is the North American Emergency Response Guidebook. It was jointly developed by Transport Canada, the United States Department of Transportation and the Secretariat of Communications and Transportation of Mexico. It is a guide for first responders to quickly identify the specific or generic hazards of material involved in a transportation incident, and to protect themselves and the general public during the initial response phase of the incident.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the Public Employees Occupational Safety and Health Act, a state law which sets PELs for New Jersey public employees.

ppb means parts of a substance per billion parts of air. It is a measure of concentration by volume in air.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A reactive substance is a solid, liquid or gas that releases energy under certain conditions.

A teratogen is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The vapor pressure is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

EMERGENCY INFORMATION

Common Name: DBCP
DOT Number: UN 2872
NAERG Code: 159
CAS Number: 96-12-8

Table with 3 columns: Hazard rating, NJDHSS, NFPA. Rows include FLAMMABILITY (2), REACTIVITY (0), and hazard descriptions like CARCINOGEN and POISONOUS GASES ARE PRODUCED IN FIRE.

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

- * DBCP is a COMBUSTIBLE LIQUID.
* Use dry chemical, CO2, water spray, or foam extinguishers.
* POISONOUS GASES ARE PRODUCED IN FIRE.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If DBCP is spilled or leaked, take the following steps:

- * Evacuate and isolate the area of the leak or spill and restrict persons not wearing protective equipment from area of spill or leak until clean-up is complete.
* Remove all ignition sources.
* Ventilate area of spill or leak.
* Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
* It may be necessary to contain and dispose of DBCP as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.
* If employees are required to clean-up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

FIRST AID

In NJ POISON INFORMATION 1-800-764-7661

Eye Contact

- * Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids.

Skin Contact

- * Remove contaminated clothing. Wash contaminated skin with soap and water.

Breathing

- * Remove the person from exposure.
* Begin rescue breathing if breathing has stopped and CPR if heart action has stopped.
* Transfer promptly to a medical facility.

PHYSICAL DATA

Vapor Pressure: 0.8 mm Hg at 68°F (20°C)

Flash Point: 170°F (77°C)

Water Solubility: Slightly soluble

OTHER COMMONLY USED NAMES

Chemical Name:

Propane, 1,2-Dibromo-3-Chloro-

Other Names:

Fumagon; Nemagon Soil Fumigant; Oxy DBCP; 1,2-Dibromo-3-Chloropropane

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NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES

Right to Know Program

PO Box 368, Trenton, NJ 08625-0368

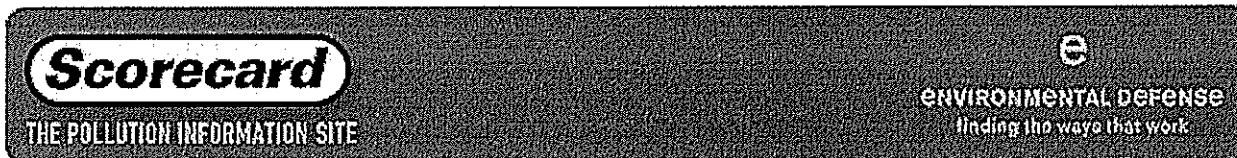
(609) 984-2202

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300

NJDEP HOTLINE: (609) 292-7172

HANDLING AND STORAGE (See page 3)



**Investigate
Pollution Topics**

TOXICS

- ▶ Toxic Chemical Releases
- ▶ Lead Hazards
- ▶ Superfund

AIR

- ▶ Smog and Particulates
- ▶ Hazardous Air Pollutants

WATER

- ▶ Clean Water Act
- ▶ Watershed Indicators

AGRICULTURE

- ▶ Animal Waste

ENVIRONMENTAL JUSTICE

- ▶ Community Center
- ▶ En Español

HEALTH HAZARDS

- ▶ Chemical Profiles
- ▶ Health Effects
- ▶ Regulations

ZIP TO YOUR COMMUNITY

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SEARCH SCORECARD

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HEALTH EFFECTS | Reproductive Toxicants

Reproductive Toxicants

Exposure to chemical substances can cause adverse effects on the male and female reproductive systems. Reproductive toxicity may be expressed as alterations in sexual behavior, decreases in fertility, or loss of the fetus during pregnancy. A reproductive toxicant may interfere with the sexual functioning or reproductive ability of exposed individuals from puberty throughout adulthood. Toxicants that target the female reproductive system can cause a wide variety of adverse effects. Changes in sexual behavior, onset of puberty, cyclicity, fertility, gestation time, pregnancy outcome, and lactation as well as premature menopause are among the potential manifestations of female reproductive toxicity: all can disrupt a woman's ability to successfully reproduce. Exposure to lead, for example, can result in menstrual disorders and infertility. The toxicants carbon disulfide, mercury, and polychlorinated biphenyls (PBCs) have been shown to cause irregularities in the menstrual cycle. Toxicants that target the male reproductive system can affect sperm count or shape, alter sexual behavior, and/or increase infertility. Carbon disulfide and the pesticides chlordecone (kepone), ethylene dibromide (EDB), and dibromochloropropane (DBCP) are examples of chemicals known to disrupt male reproductive health.

References used to compile the list of Reproductive Toxicants

Recognized Reproductive Toxicants

Note: For your convenience, these data are also available as a CSV file. [Click here to download.](#)

Chemical Name	CAS Registry Number (or EDF Substance ID)	Reference (s)
(1,2-BENZENEDICARBOXYLATO(2-)) DIOXOTRILEAD	69011-06-9	P65-MC
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8	P65
1,2-DIBROMOETHANE	106-93-4	P65
1,3-BUTADIENE	106-99-0	P65
2,3-DINITROTOLUENE	602-01-7	P65-MC
2,4-DB	94-82-6	P65
2,4-DINITROTOLUENE	121-14-2	P65
2,5-DINITROTOLUENE	619-15-8	P65-MC
2,6-DINITROTOLUENE	606-20-2	P65
3,4-DINITROTOLUENE	610-39-9	P65-MC
ACETYSALICYLIC ACID	50-78-2	P65

ADRIAMYCIN	23214-92-8	P65
ALKYL LEAD COMPOUNDS	EDF-171	P65-MC
AMINOPTERIN	54-62-6	P65
AMIODARONE HYDROCHLORIDE	19774-82-4	P65
ANABOLIC STEROIDS	EDF-006	P65
BENOMYL	17804-35-2	P65
BENZENE	71-43-2	P65
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	P65
BROMACIL LITHIUM SALT (2,4 (H,3H)-PYRIMIDINEDIONE, ETHYL-3 (1-METHYLPROPYL), LITHIUM SALT)	53404-19-6	P65
CADMIUM	7440-43-9	P65
CARBON DISULFIDE	75-15-0	P65
CHLORSULFURON	64902-72-3	P65
CHROMIUM LEAD SILICATE	11113-70-5	P65-MC
CIDOFOVIR	113852-37-2	P65
CLOBETASOL PROPIONATE	25122-46-7	P65
COCAINE	50-36-2	P65
COLCHICINE	64-86-8	P65
CYCLO-DI-;-OXO(-;PHTHALATO) TRILEAD	17976-43-1	P65-MC
CYCLOPHOSPHAMIDE	50-18-0	P65
CYCLOPHOSPHAMIDE (HYDRATED)	6055-19-2	P65
DDT	50-29-3	P65
DIFLUNISAL	22494-42-4	P65
DINITROBENZENE	25154-54-5	P65-MC
DINITROBUTYL PHENOL	88-85-7	P65
DINITROTOLUENE (MIXED ISOMERS)	25321-14-6	P65
EPICHLOROHYDRIN	106-89-8	P65
ETHYLENE GLYCOL MONOETHYL ETHER	110-80-5	P65
ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	111-15-9	P65
ETHYLENE GLYCOL MONOMETHYL ETHER	109-86-4	P65
ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	110-49-6	P65
ETHYLENE OXIDE	75-21-8	P65
ETODOLAC	41340-25-4	P65
FLUNISOLIDE	3385-03-3	P65
FLUOROACETIC ACID, SODIUM SALT	62-74-8	P65
FLURBIPROFEN	5104-49-4	P65
GANCICLOVIR SODIUM	82410-32-0	P65
GEMFIBORZIL	25812-30-0	P65
GOSERELIN ACETATE	65807-02-5	P65
HALOPERIDOL	52-86-8	P65
HEXAMETHYLPHOSPHORAMIDE	680-31-9	P65
HYDRAMETHYLNON	67485-29-4	P65
IDARUBICIN HYDROCHLORIDE	57852-57-0	P65

INORGANIC LEAD COMPOUNDS	1128	P65-MC
LEAD	7439-92-1	P65
LEAD (ALKYL 4+) (SOLNR LEAD ALKYL)	EDF-199	P65-MC
LEAD ACETATE	301-04-2	P65-MC
LEAD ARSENATE	7784-40-9	P65-MC
LEAD ARSENITE	10031-13-7	P65-MC
LEAD CHLORIDE	7758-95-4	P65-MC
LEAD CHROMATE	7758-97-6	P65-MC
LEAD CHROMATE OXIDE	18454-12-1	P65-MC
LEAD COMPOUNDS	LCT000	P65
LEAD DIOXIDE	1309-60-0	P65-MC
LEAD FLUOBORATE	13814-96-5	P65-MC
LEAD FLUORIDE	7783-46-2	P65-MC
LEAD II ARSENATE	7645-25-2	P65-MC
LEAD IODIDE	10101-63-0	P65-MC
LEAD NITRATE	10099-74-8	P65-MC
LEAD PHOSPHATE	7446-27-7	P65-MC
LEAD SILICATE	11120-22-2	P65-MC
LEAD STEARATE	7428-48-0	P65-MC
LEAD SUBACETATE	1335-32-6	P65-MC
LEAD SULFATE	7446-14-2	P65-MC
LEAD SULFIDE	1314-87-0	P65-MC
LEAD THIOCYANATE	592-87-0	P65-MC
LEAD(II) OXIDE	1317-36-8	P65-MC
LEAD-MOLYBDENUM CHROMATE	12709-98-7	P65-MC
LEUPROLIDE ACETATE	74381-53-6	P65
LEVONORGESTREL IMPLANTS	797-63-7	P65
M-DINITROBENZENE	99-65-0	P65
MELAMINE, HEXAMETHYL-	645-05-6	P65
MYCLOBUTANIL	88671-89-0	P65
NIFEDIPINE	21829-25-4	P65
NITROFURANTOIN	67-20-9	P65
O,P'-DDT	789-02-6	P65
O-DINITROBENZENE	528-29-0	P65
ORGANIC LEAD COMPOUNDS	EDF-230	P65-MC
OXYDEMETON METHYL	301-12-2	P65
P-DINITROBENZENE	100-25-4	P65
PACLITAXEL	33069-62-4	P65
PIMOZIDE	2062-78-4	P65
QUIZALOFOP-ETHYL	76578-14-8	P65
RIBAVIRIN	36791-04-5	P65
RIFAMPICIN	13292-46-1	P65
SALICYLAZOSULFAPYRIDINE	599-79-1	P65
STREPTOZOTOCIN	18883-66-4	P65
SULINDAC	38194-50-2	P65
TECHNICAL GRADE 2,4 & 2,6 DINITROTOLUENE	EDF-210	P65-MC

TETRAETHYLLEAD	78-00-2	P65-MC
TETRAMETHYL LEAD	75-74-1	P65-MC
THIOPHANATE-METHYL	23564-05-8	P65
TOBACCO SMOKE (PRIMARY)	EDF-073	P65
TRIADIMEFON	43121-43-3	P65
URACIL MUSTARD	66-75-1	P65
ZILEUTON	111406-87-2	P65

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HEALTH EFFECTS | CARCINOGENS

CARCINOGENS

Hundreds of chemicals are capable of inducing cancer in humans or animals after prolonged or excessive exposure. There are many well-known examples of chemicals that can cause cancer in humans. The fumes of the metals cadmium, nickel, and chromium are known to cause lung cancer. Vinyl chloride causes liver sarcomas. Exposure to arsenic increases the risk of skin and lung cancer. Leukemia can result from chemically induced changes in bone marrow from exposure to benzene and cyclophosphamide, among other toxicants. Other chemicals, including benzo[a]pyrene and ethylene dibromide, are considered by authoritative scientific organizations to be probably carcinogenic in humans because they are potent carcinogens in animals. Chemically-induced cancer generally develops many years after exposure to a toxic agent. A latency period of as much as thirty years has been observed between exposure to asbestos, for example, and incidence of lung cancer.

[References used to compile the list of Carcinogens](#)

Recognized Carcinogens

Note: For your convenience, these data are also available as a CSV file. [Click here](#) to download.

Chemical Name	CAS Registry Number (or EDF Substance ID)	Reference (s)
(1,1'-BIPHENYL)-4,4'-DIAMINE, 3,3'-DIMETHYL-	119-93-7	P65
(1,1'-BIPHENYL)-4,4'-DIAMINE, 3,3'-DIMETHYL-, DIHYDROCHLORIDE (9CI)	612-82-8	P65
(1,2-BENZENEDICARBOXYLATO(2-)) DIOXOTRILEAD	69011-06-9	P65-MC
(DIBUTYLDITHIOCARBAMATO)NICKEL (II)	13927-77-0	P65-MC
1,1'-BI(ETHYLENE OXIDE)	1464-53-5	P65
1,1,2,2-TETRACHLOROETHANE	79-34-5	P65
1,1,2,2-TETRAFLUROETHYLENE	116-14-3	P65
1,1,2-TRICHLOROETHANE	79-00-5	P65
1,1-DICHLOROETHANE	75-34-3	P65
1,1-DIMETHYL HYDRAZINE	57-14-7	P65
1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (MIXTURE OF ISOMERS)	608-73-1	P65 ¹

1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	39001-02-0	P65-MC
1,2,3,4,6,7,8-HEPTACHLORODIBENZOP-DIOXIN	35822-46-9	P65-MC
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	P65-MC
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	P65-MC
1,2,3,4,7,8-HEXACHLORODIBENZOP-DIOXIN	39227-28-6	P65-MC
1,2,3,4,8-PENTACHLORODIBENZOFURAN	67517-48-0	P65-MC
1,2,3,6,7,8-HEXACHLORODIBENZOP-DIOXIN	57653-85-7	P65-MC
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	P65-MC
1,2,3,7,8,9-HEXACHLORODIBENZOP-DIOXIN	19408-74-3	P65-MC
1,2,3,7,8-PENTACHLORODIBENZOP-DIOXIN	40321-76-4	P65-MC
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	P65-MC
1,2,3-TRICHLOROPROPANE	96-18-4	P65
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8	P65
1,2-DIBROMOETHANE	106-93-4	P65
1,2-DICHLOROETHANE	107-06-2	P65
1,2-DICHLOROPROPANE	78-87-5	P65
1,2-DIETHYLHYDRAZINE	1615-80-1	P65
1,2-DIMETHYLHYDRAZINE	540-73-8	P65
1,2-DIPHENYLHYDRAZINE	122-66-7	P65
1,3-BUTADIENE	106-99-0	P65
1,3-DIBROMO-2,2-DIMETHYLOLPROPANE	3296-90-0	P65
1,3-DICHLOROPROPENE (MIXED ISOMERS)	542-75-6	P65
1,3-DICHLOROPROPENE AND 1,2-DICHLOROPROPANE MIXTURE	8003-19-8	P65-MC
1,4-BUTANEDIOL DIMETHANESULFONATE (MYLERAN)	55-98-1	P65
1,4-DICHLORO-2-BUTENE	764-41-0	P65
1,4-DICHLOROBENZENE	106-46-7	P65
1,4-DIOXANE	123-91-1	P65
1,6-DINITROPYRENE	42397-64-8	P65
1,8-DINITROPYRENE	42397-65-9	P65
1-(2-CHLOROETHYL)-3-(4-METHYLCYCLOHEXYL)-1-NITROUREA (METHYL CCNU)	13909-09-6	P65
1-(2-CHLOROETHYL)-3-CYCLOHEXYL-1-NITROUREA	13010-47-4	P65
1-ALLYL-4-METHOXYBENZENE	140-67-0	P65



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1,2-Dibromo-3-Chloropropane (DBCP)

96-12-8

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Hazard Summary-Created in April 1992; Revised in January 1996

1,2-Dibromo-3-chloropropane (DBCP) was used in the past as a soil fumigant; nematocide on crops; it is no longer used except as an intermediate in chemical synthesis. Acute (short-term) exposure to DBCP in humans results in moderate depression of the central nervous system (CNS) and pulmonary congestion from inhalation, and gastrointestinal distress and pulmonary edema from oral exposure. Chronic (long-term) exposure to DBCP in humans causes male reproductive effects as decreased sperm counts. Testicular effects and decreased sperm counts were observed in animals chronically exposed to DBCP by inhalation. Available human data on DBCP and cancer are inadequate. High incidences of tumors of the nasal tract, adrenal cortex, and lungs of rodents were reported in a National Toxicology Program (NTP) inhalation study. EPA has classified DBCP as a Group B2, probable human carcinogen.

Please Note: The main sources of information for this fact sheet are EPA's [Integrated Information System \(IRIS\)](#), which contains information on inhalation chronic toxicity of DBCP and the Reference Concentration (RfC) and the Agency for Toxic Substances and Disease Registry's (ATSDR's) [Toxicological Profile for 1,2-Dibromo-3-Chloropropane](#).

Uses

- Until 1977, DBCP was used as a soil fumigant and nematocide on over 40 different crops in the United States. From 1977 to 1979, EPA suspended registration for all DBCP containing products except for use on pineapples in Hawaii. In 1985, EPA issued a final rule intent to cancel all registrations for DBCP, including use on pineapples. Subsequent to the use of existing stocks of DBCP was prohibited. (2)
- DBCP is used as an intermediate in the synthesis of organic chemicals. (1,2)

Sources and Potential Exposure

- Human exposure to DBCP could result from the ingestion of contaminated water and food. (2)
- In the past, release of DBCP to the environment occurred primarily from its fumigant and nematocide uses; because of the cancellation of all DBCP uses, environmental release is expected to decline with time. (1,2)

Assessing Personal Exposure

- DBCP can be measured in exhaled air, blood, and biological tissues. Samples should be collected shortly after exposure, because DBCP is rapidly eliminated from the body.

Health Hazard Information

Acute Effects:

- Acute exposure to DBCP produces moderate depression of the CNS and pulmonary congestion after exposure by inhalation, and gastrointestinal distress and pulmonary edema after oral exposure in humans. (1,2)
- In rats acutely exposed to DBCP by inhalation, pulmonary and ocular irritation, kidney, liver, spleen, and CNS effects have been observed. (2)
- Dermal exposure to DBCP may irritate the skin and eyes in humans and animals.
- Tests involving acute exposure of rats, mice, rabbits, and guinea pigs have determined DBCP to have high acute toxicity from inhalation, oral, and dermal exposure. (1)

Chronic Effects (Noncancer):

- No information is available on the chronic effects of DBCP in humans. (2)
- Chronic exposure to DBCP by inhalation has been reported to affect the nasal cavity, spleen, adrenal gland, kidneys, stomach, and liver in rats and mice. (4)
- The Reference Concentration (RfC) for DBCP is 0.0002 milligrams per cubic meter (mg/m^3) based on testicular effects in rabbits. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to DBCP over a lifetime of a human population (including sensitive subgroups), that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. It is not a direct estimate of risk, rather a reference point to gauge the potential effects. At exposures increasing above the RfC, the potential for adverse health effects increases. Lifetime exposure to the RfC does not imply that an adverse health effect would necessarily occur. (4)
- EPA has medium confidence in the study on which the RfC was based due to (1) reporting respiratory effects; medium confidence in the database because although chronic studies in two different species exist, the available reproductive studies are limited and there is uncertainty about occurrence of respiratory tract effects relative to testicular effects; and, consequently, medium confidence in the RfC. (4)
- EPA has not established a Reference Dose (RfD) for DBCP. (4)
- ATSDR has established an intermediate oral minimal risk level (MRL) of 0.002 milligrams per kilogram body weight per day ($\text{mg}/\text{kg}/\text{d}$) based on reproductive effects in rats. The MRL is an estimate of the daily human exposure to a hazardous substance that would be without appreciable risk of adverse noncancer health effects over a specific duration of exposure. (2)

Reproductive/Developmental Effects:

- Chronic exposure to DBCP causes male reproductive effects. Decreased sperm counts have been observed in men occupationally exposed to DBCP; birth defects, perinatal mortality, or spontaneous abortions were not associated with paternal exposure. (2,4)
- Testicular effects and decreased sperm count were observed in animals chronically exposed to DBCP by inhalation. (4)
- Birth defects were not observed in rats exposed to DBCP by gavage (experimentally placing the chemical in their stomachs). (2,4)

Cancer Risk:

- Human data are inadequate on DBCP and cancer. The available studies involve occupational exposures to various chemicals and do not control for confounding factors. (1,2,4)
- A study by the NTP reported tumors of the respiratory tract and tongue in male rats, tumors of the adrenal cortex in female rats, and tumors of the nasal cavity in male and female mice when exposed to DBCP by inhalation. (8)
- A study by the National Cancer Institute (NCI) reported tumors of the forestomach and mammary gland tumors in female rats exposed to DBCP by gavage. (10)
- EPA has classified DBCP as a Group B2, probable human carcinogen. (10)
- EPA has calculated an oral cancer slope factor of $1.4 (\text{mg}/\text{kg}/\text{d})^{-1}$ and an inhalation cancer risk factor of $6.9 \times 10^{-7} (\mu\text{g}/\text{m}^3)^{-1}$. (10)

Physical Properties

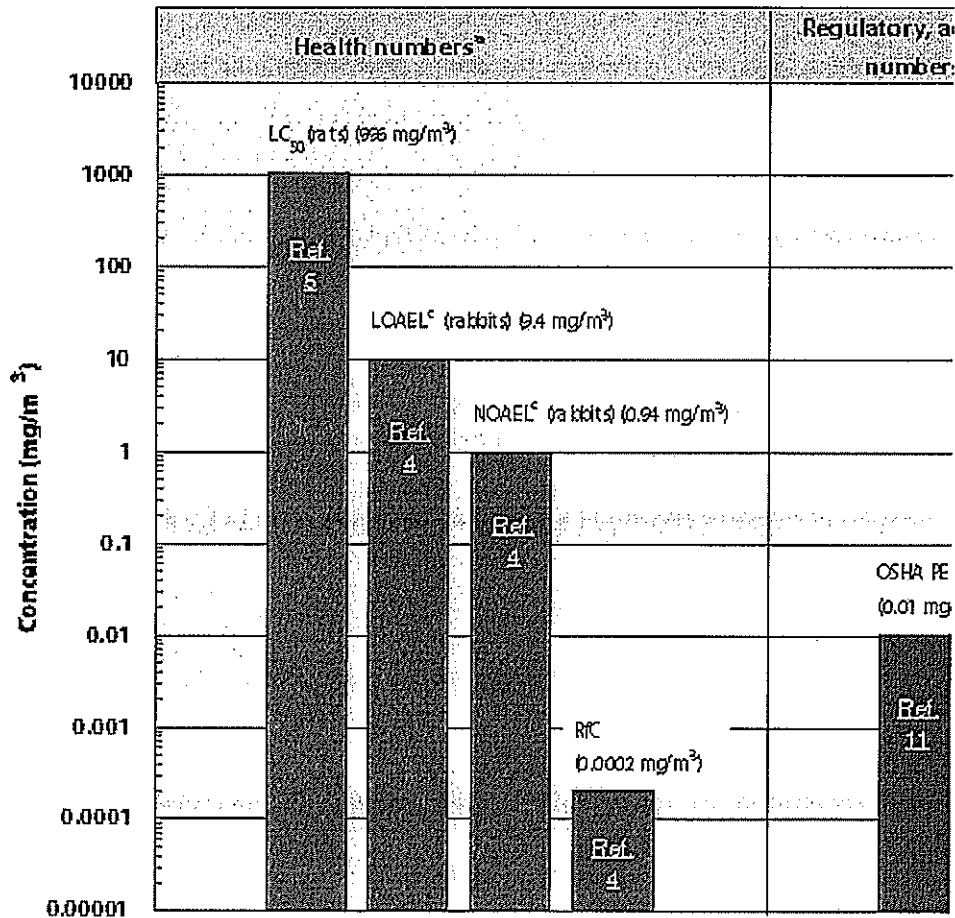
- The chemical formula for DBCP is C₃H₅Br₂Cl, and the molecular weight is 236 (2,3,7,8)
- DBCP occurs as a colorless liquid when pure, and commercial grades as a dark-brown liquid that is slightly soluble in water. (2,3,6)
- DBCP has a pungent odor with an odor threshold of 0.3 mg/m³. (1,2)
- The vapor pressure for DBCP is 0.8 mm Hg at 21 °C, and its log octanol/water coefficient (log K_{ow}) is 2.43. (6)

Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to mg/m³: $mg/m^3 = (ppm) \times (mol\ weight\ of\ the\ compound) / (24.45)$. For 1,2-dibromo-3-chloropropane: 1 ppm = 9.7 mg/m³

Health Data from Inhalation Exposure

1,2-Dibromo-3-Chloropropane



LC₅₀ (Lethal Concentration₅₀)--A calculated concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in 50% of a defined experimental animal population.

LOAEL--Lowest-observed-adverse-effect level.

NOAEL--No-observed-adverse-effect level.

OSHA PEL--Occupational Safety and Health Administration's permissible exposure limit

expressed as a time-weighted average; the concentration of a substance to which one can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h

The health and regulatory values cited in this factsheet were obtained in December 1997.

^a Health numbers are toxicological numbers from animal testing or risk assessment values developed by EPA.

^b Regulatory numbers are values that have been incorporated in Government regulatory standards. Advisory numbers are nonregulatory values provided by the Government or other groups on their own advice. OSHA numbers are regulatory.

^c The LOAEL and NOAEL are from the critical study used as the basis for the EPA RfD.

References

1. U.S. Department of Health and Human Services. Hazardous Substances Data (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
2. Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile for 1,2-Dibromo-3-Chloropropane*. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1992.
3. *The Merck Index. An Encyclopedia of Chemicals, Drugs, and Biologicals*. 11th Edition. Budavari. Merck and Co. Inc., Rahway, NJ. 1989.
4. U.S. Environmental Protection Agency. *Integrated Risk Information System (IRIS) for 1,2-Dibromo-3-chloropropane*. National Center for Environmental Assessment, Office of Research and Development, Washington, DC. 1999.
5. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
6. International Agency for Research on Cancer (IARC). *IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Some Halogenated Hydrocarbons*. Volume 20. World Health Organization, Lyon. 1979.
7. M. Sittig. *Handbook of Toxic and Hazardous Chemicals and Carcinogens*. 2nd Edition. Publications, Park Ridge, NJ. 1985.
8. National Toxicology Program. *Carcinogenesis Bioassay of 1,2-Dibromo-3-Chloropropane (CAS No. 96-12-8) in F344/N Rats and B6C3F₁ Mice (Inhalation Study)*. TR No. 28. Department of Health and Human Services, Public Health Service, National Institute of Health, Bethesda, MD. 1982.
9. National Cancer Institute. *Bioassay of Dibromochloropropane for Possible Carcinogenicity (CAS No. 96-12-8)*. TR-28. National Cancer Institute, Division of Cancer Cause and Prevention, Bethesda, MD. 1978.
10. U.S. Environmental Protection Agency. *Health Effects Assessment Summary for 1,2-Dibromo-3-Chloropropane, 1997 Update*. Solid Waste and Emergency Response, Office of Emergency and Remedial Response, Cincinnati, OH. EPA/540/R-97-036. 1997.
11. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. *Code of Federal Regulations*. 29 CFR 1910.1044. 1998.

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URL: <http://www.epa.gov/ttn/atw/hlthef/dibromo-.html>