

# Report on Carcinogens

**Appendix A**  
**Cancer Hazards Not Included in the NTP Report on Carcinogens**

**Appendix B**  
**Substances Delisted from the Report on Carcinogens**

**Appendix C**  
**Substances Reviewed but Not Recommended for Listing in the Report on Carcinogens**

**Appendix D**  
**15th RoC and Monographs - Collaborators and Contributors**

**Appendix E**  
**Chemicals Nominated to the NTP for In-Depth Toxicological Evaluation**

**Appendix F**  
**Substance Names and Common Synonyms**

**Appendix G**  
**Listed Substances by CAS Number**

## Appendix A: Cancer Hazards Not Included in the NTP Report on Carcinogens

Certain manufacturing processes, occupations, and other exposure circumstances have been classified as carcinogens by authoritative sources, including the International Agency for Research on Cancer (IARC), the World Cancer Research Fund (WCRF), and the National Toxicology Program (NTP). These cancer hazards are not included in the Report on Carcinogens (RoC) either because of uncertainty as to whether they meet the legislative mandate of the RoC or because certain aspects of these exposures may differ in different parts of the world.

### Occupational practices or manufacturing processes classified by IARC or NTP as carcinogenic to humans

- Acheson process, occupational exposure associated with (synthesis of silicon carbide) (IARC 2017)
- Aluminum production, occupational exposures during (IARC 2012b)
- Auramine production (IARC 2012c)
- Coal gasification (IARC 2012d)
- Coal-tar distillation, occupational exposures during (IARC 2012e)
- Coke production (IARC 2012f)
- Hematite mining, underground, with exposure to radon (IARC 2012g)
- Iron and steel founding, occupational exposure during (IARC 2012h)
- Isopropyl alcohol manufacture by the strong-acid process (IARC 2012i)
- Persistent night shift work that causes circadian disruption (NTP 2018)
- Magenta production (IARC 2012a)
- Painter, occupational exposure as a (IARC 2012l)
- Rubber-manufacturing industry, occupational exposures in the (IARC 2012m)
- Ultraviolet radiation from welding (IARC 2018c)

### Dietary factors classified as cancer hazards by WCRF (convincing evidence) or IARC (carcinogenic to humans)

- Obesity, overweight, or body fatness (IARC 2018b, WCRF 2018)
- Processed meat (IARC 2018a, WCRF 2018)
- Salted fish, Chinese style (IARC 2012o, WCRF 2018)
- Other exposure scenarios classified by IARC or NTP as Cancer Hazards
- Estrogen-only menopausal therapy (IARC 2012n)<sup>1,2</sup>
- Estrogen-progestogen, menopausal therapy (IARC 2012j)
- Estrogen-progestogen, oral contraceptives (IARC 2012k)<sup>2</sup>

## References

IARC. 2012a. Magenta and magenta production. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 105-110.

<sup>1</sup>Estrogens, steroidal are listed in the RoC as known to be human carcinogens based on sufficient evidence of carcinogenicity from studies in humans, which consist mainly of studies of estrogen postmenopausal therapy.

<sup>2</sup>IARC's conclusions are discussed in the Estrogens, Steroidal substance profile.

IARC. 2012b. Occupational exposures during aluminium production. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 215-223.

IARC. 2012c. Auramine and auramine production. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 101-104.

IARC. 2012d. Coal gasification. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 145-152.

IARC. 2012e. Occupational exposures during coal-tar distillation. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 153-160.

IARC. 2012f. Coke production. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 167-178.

IARC. 2012g. Internalized  $\alpha$ -particle emitting radionuclides. In *Radiation*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100D. Lyon, France: International Agency for Research on Cancer. pp. 241-283.

IARC. 2012h. Occupational exposures during iron and steel founding. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 497-507.

IARC. 2012i. Isopropyl alcohol manufacture by the strong-acid process. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 479-485.

IARC. 2012j. Combined estrogen-progestogen menopausal therapy. In *Pharmaceuticals*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100A. Lyon, France: International Agency for Research on Cancer. pp. 249-282.

IARC. 2012k. Combined estrogen-progestogen contraceptives. In *Pharmaceuticals*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100A. Lyon, France: International Agency for Research on Cancer. pp. 283-317.

IARC. 2012l. Occupational exposures as a painter. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 509-539.

IARC. 2012m. Occupational exposures during rubber manufacturing. In *Chemical Agents and Related Occupations*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100F. Lyon, France: International Agency for Research on Cancer. pp. 541-562.

IARC. 2012n. Estrogen-only menopausal therapy. In *Pharmaceuticals*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100A. Lyon, France: International Agency for Research on Cancer. pp. 219-247.

IARC. 2012o. Chinese-style salted fish. In *Personal Habits and Indoor Combustions*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 100E. Lyon, France: International Agency for Research on Cancer. pp. 501-514.

IARC. 2017. Silicon carbide. In *Some Nanomaterials and Some Fibres*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 111. Lyon, France: International Agency for Research on Cancer. pp. 243-313.

IARC. 2018a. *Red Meat and Processed Meat*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 114. Lyon, France: International Agency for Research on Cancer. 517 pp.

IARC. 2018b. *Absence of Excess Body Fatness*. IARC Handbooks of Cancer Prevention, vol. 16. Lyon, France: International Agency for Research on Cancer. 658 pp.

IARC. 2018c. *Welding, Molybdenum Trioxide, and Indium Tin Oxide*. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, vol. 118. Lyon, France: International Agency for Research on Cancer. 320 pp.

NTP. 2018. *Draft Report on Carcinogens Monograph on Night Shift Work and Light at Night*. Research Triangle Park, NC: National Toxicology Program. 350 pp. <https://ntp.niehs.nih.gov/go/717273>.

WCRF. 2018. *Diet, Nutrition, Physical Activity, and Cancer: a Global Perspective*. London, England: World Cancer Research Fund. 116 pp. <http://dietandcancerreport.org>.

## Appendix B: Substances Delisted from the Report on Carcinogens

The agents, substances, mixtures, or exposure circumstances contained in this appendix were previously listed in the Report on Carcinogens (RoC) as either *known* or *reasonably anticipated to be human carcinogens*. For substances removed from the RoC prior to the 1996 establishment of a formal review procedure for delisting substances from the RoC, the table below shows the reason for delisting. The table indicates the last edition of the RoC in which these substances appeared, to which reference can be made for all information available.

For each substance removed from the RoC as a result of a formal review for delisting (from the Eighth Edition forward), a profile is provided following the table, which summarizes the review for delisting, including the relevant information and the issues identified by the scientific review groups that led to the substance's delisting.

Substance Name	CAS Number	Last Listing	Reason for Delisting
Chloramphenicol	56-75-7	<i>known</i> First RoC (1980)	Human data considered inadequate
Aramite	140-57-8	<i>reasonably anticipated</i> Fourth RoC (1985)	No U.S. residents exposed
<i>N,N</i> -Bis(2-chloroethyl)-2-naphthylamine (chlornaphazine)	494-03-1	<i>known</i> Fourth RoC (1985)	No U.S. residents exposed
Cycasin	14901-08-7	<i>reasonably anticipated</i> Fourth RoC (1985)	No U.S. residents exposed
Methyl iodide	78-88-4	<i>reasonably anticipated</i> Fourth RoC (1985)	Reevaluated by IARC; evidence now considered equivocal
5-Nitro- <i>o</i> -anisidine	99-59-2	<i>reasonably anticipated</i> Fifth RoC (1989)	Insufficient evidence of carcinogenicity
<i>p</i> -Nitrosodiphenylamine	156-10-5	<i>reasonably anticipated</i> Fifth RoC (1989)	Insufficient evidence of carcinogenicity
Ethyl acrylate	140-88-5	<i>reasonably anticipated</i> Eighth RoC (1998)	See following profile
Saccharin	81-07-2	<i>reasonably anticipated</i> Eighth RoC (1998)	See following profile

## Report on Carcinogens Review Group Actions on the Nomination of Ethyl Acrylate for Delisting from the Report on Carcinogens

Summary of data contained in the Ethyl Acrylate Background Document (December 1998)

### Ethyl Acrylate

#### CAS No. 140-88-5

Ethyl acrylate is used in various industries as an intermediate in the production of emulsion-based polymers which are then used in paint formulations, industrial coatings, and latex products. It is also used as a synthetic flavoring substance and fragrance adjuvant in consumer products. Human exposure to ethyl acrylate occurs mostly through inhalation of ethyl acrylate vapors, but it may also result from skin contact or ingestion as a food additive or from drinking of contaminated water. The Report on Carcinogens review groups considered the data underlying the nomination to remove ethyl acrylate from the Report on Carcinogens, where it has been listed as *reasonably anticipated to be a human carcinogen* since 1989. The basis for this listing was a gavage study that resulted in dose-related benign and malignant forestomach neoplasms in rats and mice. The Basic Acrylic Monomer Manufacturers, Inc. (BAMM), submitted a nomination to remove ethyl acrylate from the Report on Carcinogens based upon the following information: (1) negative tumorigenicity results from chronic-exposure studies using routes other than gavage in corn oil, (2) research results suggesting that the forestomach carcinogenicity observed in the gavage studies was secondary to a site-specific and concentration-dependent irritating effect of ethyl acrylate, and (3) the fact that significant human exposure to ethyl acrylate monomer is unlikely in light of current manufacturing practices and patterns of usage (see Human Exposure and Cancer Studies in Humans, below).

The majority opinion of the Report on Carcinogens review groups was to recommend that ethyl acrylate be removed from the Report on Carcinogens. This opinion was based on the facts that (1) the forestomach tumors induced in animal studies were seen only when ethyl acrylate was administered by gavage at high concentrations that induced marked local irritation and cellular proliferation, (2) animal studies using other routes of administration, including inhalation, gave negative results, and (3) significant chronic human oral exposure to high concentrations of ethyl acrylate monomer is unlikely. Therefore, ethyl acrylate does not meet the criteria to be listed in the Report on Carcinogens as *reasonably anticipated to be a human carcinogen*.

### Summary of Available Carcinogenicity Data and Other Relevant Information

#### Cancer Studies in Experimental Animals

Although mutagenic in some *in vitro* tests, ethyl acrylate is not genotoxic under *in vivo* physiological conditions, perhaps because of its rapid metabolism to acrylic acid and ethanol by carboxyesterases and detoxification through binding to non-protein sulfhydryls. Target tissue toxicity in the form of irritation was observed in the skin in a lifetime mouse skin-painting study, in the nasal olfactory mucosa in 27-month inhalation studies in rats and mice, and in the forestomach in two-year corn-oil gavage studies in rats and mice. Only body-weight reduction was observed in a two-year study of exposure via drinking water in rats. The forestomach carcinogenicity observed in the corn-oil gavage studies was the only treatment-related tumorigenic response in the various animal studies. The irritation, hyper-

plasia, and tumor responses in the forestomach were related more to target-tissue concentration of ethyl acrylate than to delivered dose in the chronic gavage study. Based upon stop-exposure studies, gavage doses of ethyl acrylate in corn oil sufficient to induce sustained mucosal hyperplasia in the forestomach must be administered for longer than six months to induce forestomach neoplasia.

#### Human Exposure and Cancer Studies in Humans

Prolonged consumer exposure to high levels of ethyl acrylate monomer by the oral route is unlikely. Potentially significant exposures would most likely occur in an occupational setting where the routes of exposure would be dermal or by inhalation. Ethyl acrylate has a strong acrid odor (odor threshold ~ 0.5 ppb) and is a known irritant to the skin, eyes, and mucous membranes, making it unlikely that humans would be chronically exposed to high concentrations. Data provided in the BAMM nomination on worker exposure showed occupational exposure well below the threshold limit value (TLV = 5 ppm for an eight-hour time-weighted average) and the short-term exposure limit (STEL = 15 ppm), although exposure of painters in an unventilated room has been reported to be as high as 8 ppm in the painter's breathing zone.

An epidemiology study reported on mortality from cancer of the colon and rectum in three separate cohorts of workers from two plants manufacturing and polymerizing acrylate monomers. Workers were exposed to ethyl acrylate and methyl methacrylate monomer between 1933 and 1982. Risks for both types of cancer were associated with exposure in the earliest cohort, although the rectal cancer results are imprecise because of the small number of cases involved. The greatest relative risk was found in workers with the highest level of exposure and a 20-year latency. The other two cohorts, with later dates of hire, showed no excess risk, but very few cases were available for observation. This study, by itself, can neither establish nor rule out a causal relationship of ethyl acrylate with cancer.

#### Action on Nomination

Ethyl acrylate will be removed from the Report on Carcinogens because the relevant data are not sufficient to meet the current criteria to list this chemical as *reasonably anticipated to be a human carcinogen*. This is based on the fact that the forestomach tumors induced in animal studies were seen only when the chemical was administered by gavage at high concentrations of ethyl acrylate that induced marked local irritation and cellular proliferation, and because significant chronic human exposure to high concentrations of ethyl acrylate monomer is unlikely.

## Report on Carcinogens Review Group Actions on the Nomination of Saccharin for Delisting from the Report on Carcinogens

Summary of data contained in the Saccharin Background Document (October 1997)

### Saccharin

#### CAS No. 81-07-2

Saccharin and its sodium and potassium salts have been produced commercially in the United States for over 80 years. Saccharin is primarily used as a non-nutritive sweetening agent. Potential exposure to saccharin occurs through the consumption of dietetic foods and drinks and the use of some personal hygiene products. Potential exposure to saccharin also occurs in the workplace, specifically in occupations, industries, or facilities that produce and deal with saccharin



and its salts. The Report on Carcinogens review groups considered the data underlying the nomination to remove saccharin from the Report on Carcinogens where it has been listed as *reasonably anticipated to be a human carcinogen* since 1981. The basis for this listing was sufficient evidence of carcinogenicity in experimental animals. The Calorie Control Council submitted a nomination to the NTP to consider removing saccharin from the Report on Carcinogens based upon mechanistic data related to development of urinary-bladder cancers in rats (see Studies on Mechanisms of Carcinogenesis, below).

The majority opinion of the review groups was to recommend that saccharin be removed from the Report on Carcinogens. There is evidence for the carcinogenicity of saccharin in rats, but less convincing evidence in mice. Studies indicate that the observed urinary-bladder cancers in rats are related to the physiology of the rat urinary system, including urinary pH, osmolality, volume, the presence of precipitate, and urothelial damage with attendant hyperplasia following consumption of diets containing sodium saccharin at concentrations of 3% or higher, with inconsistent findings at lower dietary concentrations. The factors thought to contribute to tumor induction by sodium saccharin in rats would not be expected to occur in humans. The mouse data are inconsistent and require verification by additional studies. Results of several epidemiology studies indicate no clear association between saccharin consumption and urinary-bladder cancer. Although it is impossible to conclude with absolute certainty that it poses no threat to human health, sodium saccharin is not *reasonably anticipated to be a human carcinogen* under conditions of general usage as an artificial sweetener.

## Summary of Available Carcinogenicity Data and Other Relevant Information

### Cancer Studies in Experimental Animals

In four studies of up to 30 months' duration, sodium saccharin was carcinogenic in Charles River CD and Sprague-Dawley male rats, as evidenced by a dose-related increased incidence of benign or malignant urinary-bladder neoplasms at dietary concentrations greater than 1% (Tisdell *et al.* 1974, Arnold *et al.* 1980, Taylor *et al.* 1980, Schoenig *et al.* 1985). Non-statistically-significant increases in urinary-bladder cancer also were seen in saccharin-exposed female rats in studies showing a positive effect in males (Arnold *et al.* 1980, Taylor *et al.* 1980). Furthermore, several initiation/promotion studies in different rat strains showed a reduced latency and/or increased incidence of similar urinary-bladder cancers in male and female rats fed sodium saccharin after treatment with various urinary-bladder tumor initiators (e.g., Hicks and Chowanec 1977, Cohen *et al.* 1979, Nakanishi *et al.* 1980a, West *et al.* 1986, Fukushima *et al.* 1990). Several additional rat studies in which sodium saccharin was administered either in the diet or in drinking water gave negative results for tumorigenicity (Fitzhugh *et al.* 1951, Lessel 1971, Schmähl 1973, Chowanec and Hicks 1979, Hooson *et al.* 1980, Schmähl and Habs 1984).

Three mouse studies reported carcinogenicity following exposure to saccharin. Two of these studies involved surgical implantation of saccharin-containing cholesterol pellets into the urinary bladders and resulted in development of malignant urothelial neoplasms (Allen *et al.* 1957, Bryan *et al.* 1970). In the third study, dietary exposure to sodium saccharin resulted in increased incidences of malignant thyroid-gland neoplasms (Prasad and Rai 1986). Although the data from studies in mice cannot be discounted, some of these studies had methodological flaws, provided limited information, did not show a dose-response relationship, or had unexpected outcomes that may be species- or strain-specific, and should be verified by additional studies. The results of four studies in mice were

judged negative for tumorigenesis (Roe *et al.* 1970, Kroes *et al.* 1977, Homberger 1978, Frederick *et al.* 1989), as were limited studies in nonhuman primates (McChesney *et al.* 1977, Sieber and Adamson 1978, Thorngierson *et al.* 1994, Cohen *et al.* 1996) and a single hamster study (Althoff *et al.* 1975).

### Cancer Studies in Humans

Most of the relevant human epidemiology studies examined associations between urinary-bladder cancer and artificial sweeteners, rather than saccharin *per se*. The time-trend data for urinary-bladder cancer showed no clear indication that the increased use of saccharin or artificial sweeteners commencing in the 1940s was associated with a general increase in urinary-bladder cancer when confounding factors, chiefly smoking, were controlled for. Risks of urinary-bladder cancer in diabetics, who presumably consume greater amounts of artificial sweeteners than the general population, were no greater than risks in the general population (Armstrong and Doll 1975). Based upon several case-control studies, there was no overall association between use of artificial sweeteners and urinary-bladder cancer (reviewed by IARC 1980, 1987b, JECFA 1993). However, an association between use of artificial sweeteners and urinary-bladder cancer could not be ruled out in some case-control subgroups, albeit involving small numbers (Howe *et al.* 1980, Hoover and Strasser 1980, Cartwright *et al.* 1981, Morrison *et al.* 1982, Mommsen *et al.* 1983). Taken together, the available epidemiology data show no consistent evidence that saccharin is associated with increased urinary-bladder cancer in general; however, a small increased risk in some subgroups, such as heavy users of artificial sweeteners, cannot be unequivocally excluded. With regard to the general population, if sodium saccharin is a risk factor, it is weak, and a causal relationship with cancer cannot be proven or disproven, because of a lack of exposure data and intrinsic limitations of the available epidemiology studies.

### Studies on Mechanisms of Carcinogenesis

Extensive studies of the mutagenicity and genotoxicity of saccharin have shown generally negative but occasionally conflicting results. Sodium saccharin is essentially nonmutagenic in conventional bacterial systems, but is weakly clastogenic or genotoxic in short-term *in vitro* and in some *in vivo* test systems (reviewed by Ashby 1985, IARC 1987a,b, Whysner and Williams 1996). Urine from mice exposed to sodium saccharin was mutagenic in *Salmonella typhimurium* in one study (Batzinger *et al.* 1977). Saccharin does not covalently bind to DNA and does not induce unscheduled DNA synthesis in urinary-bladder urothelium.

Saccharin-induced carcinogenesis in rats showed a sex predilection for males (Tisdell *et al.* 1974, Arnold *et al.* 1980, Taylor *et al.* 1980), an organ specificity for urinary bladder (Tisdell *et al.* 1974, Arnold *et al.* 1980, Taylor *et al.* 1980, Fukushima *et al.* 1983, Schoenig *et al.* 1985), and a dose-response when exposure to dietary concentrations of 1% to 7.5% of the sodium salt of saccharin was begun early in life (beginning at birth or immediately at weaning) and continued for approximately two years (Schoenig *et al.* 1985). The results of mechanistic studies have shown that certain physiological conditions must be simultaneously or sequentially present for induction of urinary-bladder tumorigenesis. These conditions include a urinary pH greater than 6.5, increased urinary sodium concentration, increased urine volume, decreased urine osmolality, and presence of urinary crystals or precipitate, with resulting damage to the urothelium prompting a proliferative (hyperplastic) response of the urinary-bladder epithelium. All of these conditions have been studied extensively in male rats but less so in female rats or in mice. The high levels of urinary protein characteristically produced by male rats may partially explain

## Report on Carcinogens, Fifteenth Edition

the sex predilection. The high intrinsic rate of urothelial proliferation at about the time of weaning is also believed to contribute to the observed tumorigenic effects. The urinary milieu in rats, especially male rats, is sufficiently different from that in humans or other species to support the contention that these observations are specific to rats. Pharmacokinetic and metabolism data on sodium saccharin do not explain the male rat's sensitivity for induction of urinary-bladder neoplasms (Sweatman and Renwick 1979, 1980).

### Action On Nomination

Saccharin will be removed from the Report on Carcinogens, because the data on cancer in rodents are not sufficient to meet the current criteria to list this chemical as *reasonably anticipated to be a human carcinogen*. This decision is based on the perception that the observed urinary-bladder tumors in rats arise by mechanisms not relevant to humans, and the lack of data in humans suggesting a carcinogenic hazard.

### References

- Allen MJ, Boyland E, Dukes CE, Horning ES, Watson JG. 1957. Cancer of the urinary bladder induced in mice with metabolites of aromatic amines and tryptophan. *Br J Cancer* 11:212-231.
- Althoff J, Cardesa A, Pour P, Shubik P. 1975. A chronic study of artificial sweeteners in syrian golden hamsters. *Cancer Lett* 1:21-24.
- Armstrong B, Doll R. 1975. Bladder cancer mortality in diabetics in relation to saccharin consumption and smoking habits. *Br J Prev Soc Med* 29:73-81.
- Arnold DL, Moodie CA, Grice HC, Charbonneau SM, Stavric B, Collins BT, Mcguire PF, Zawidzka ZZ, Munro IC. 1980. Long-term toxicity of *ortho*-toluenesulfonamide and sodium saccharin in the rat. *Toxicol Appl Pharmacol* 52:113-152.
- Ashby J. 1985. The genotoxicity of sodium saccharin and sodium chloride in relation to their cancer-promoting properties. *Food Chem Toxicol* 23:507-519.
- Batzinger RP, Ou S-YL, Bueding E. 1977. Saccharin and other sweeteners: Mutagenic properties. *Science* 198:944-946.
- Bryan GT, Erturk E, Yoshida O. 1970. Production of urinary bladder carcinomas in mice by sodium saccharin. *Science* 168:1238-1240.
- Cartwright RA, Adib R, Ghashan R, Gray BK. 1981. The epidemiology of bladder cancer in West Yorkshire. A preliminary report on non-occupational aetiologies. *Carcinogenesis* 2:343-346.
- Chowaniec J, Hicks RM. 1979. Response of the rat to saccharin with particular reference to the urinary bladder. *Br J Cancer* 39:355-375.
- Cohen SM, Arai M, Jacobs JB, Friedell GH. 1979. Promoting effect of saccharin and *DL*-tryptophan in urinary bladder carcinogenesis [Abstract]. *Cancer Res* 39:1207-1217.
- Cohen SM, Arnold LL, Cano M, Thorgeirsson U, Takayama S. 1996. Lack of effect of sodium saccharin feeding on monkey urine and urinary bladder epithelium [Abstract]. *Proc Am Assoc Cancer Res* 37:108.
- Fitzhugh OG, Nelson AA, Frawley JP. 1951. A comparison of the chronic toxicities of synthetic sweetening agents. *J Am Pharm Assoc* 40:583-586.
- Fukushima S, Arai M, Nakanowatari J, Hibino T, Okuda M, Ito N. 1983. Differences in susceptibility to sodium saccharin among various strains of rats and other animal species. *Gann* 74:8-20.
- Fukushima S, Uwagawa S, Shirai T, Hasegawa R, Ogawa K. 1990. Synergism by sodium L-ascorbate but inhibition by L-ascorbic acid for sodium saccharin promotion of rat two-stage bladder carcinogenesis. *Cancer Res* 50:4195-4198.
- Hicks RM, Chowaniec J. 1977. The importance of synergy between weak carcinogens in the induction of bladder cancer in experimental animals and humans. *Cancer Res* 37:2943-2949.
- Homburger F. 1978. Negative lifetime carcinogen studies in rats and mice fed 50,000 ppm saccharin. In *Chemical Toxicology of Food*. Galli CL, Paoletti R, Vettorazzi G, eds. Amsterdam: Elsevier/North-Holland Biomedical Press. pp. 359-373.
- Hooson J, Hicks RM, Grasso P, Chowaniec J. 1980. *ortho*-Toluene sulfonamide and saccharin in the promotion of bladder cancer in the rat. *Br J Cancer* 42(1): 129-147.
- Hoover RN, Strasser PH. 1980. Artificial sweeteners and human bladder cancer: Preliminary results. *Lancet* 1(8173):837-840.
- Howe GR, Burch JD, Miller AB, Cook GM, Esteve J, Morrison B, et al. 1980. Tobacco use, occupation, coffee, various nutrients, and bladder cancer. *J Natl Cancer Inst* 64(4): 701-713.
- IARC. 1980. Saccharin. In *Some Non-Nutritive Sweetening Agents*. IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, vol. 22. Lyon, France: International Agency for Research on Cancer. pp. 111-170.
- IARC. 1987a. Saccharin. In *Genetic and Related Effects: An Updating of Selected IARC Monographs from Volumes 1-42*. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans, suppl. 6. Lyon, France: International Agency for Research on Cancer. pp. 488-496.
- IARC. 1987b. Saccharin. In *Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1-42*. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans, suppl. 7. Lyon, France: International Agency for Research on Cancer. pp. 334-339.
- JECFA. 1993. Saccharin and Its Salts. In *Toxicological Evaluation of Certain Food Additives and Contaminants*. Joint FAO/WHO Expert Committee on Food Additives. WHO Food Additives Series no. 32. International Programme on Chemical Safety. <http://www.inchem.org/documents/jecfa/jecmono/v32je09.htm>.
- Kroes R, Peters PWJ, Berkvens JM, HG Verschuuren, De Vries T, van Esch GJ. 1977. Long term toxicity and reproduction study (including a teratogenicity study) with cyclamate, saccharin and cyclohexylamine. *Toxicology* 8:285-300.
- Lessel B. 1971. Carcinogenic and teratogenic aspects of saccharin. In *Proceedings of the Third International Congress of Food Science and Technology, S05/70*. Chicago, IL: Institute of Food Technologists. pp. 764-770.
- McChesney EW, Coulston F, Benitz K-F. 1977. Six-year study of saccharin in rhesus monkeys [Abstract]. *Toxicol Appl Pharmacol* 41:164.
- Mommsen S, Aagaard J, Sell A. 1983. A case-control study of female bladder cancer. *J Cancer Clin Oncol* 19:725-729.
- Morrison AS, Verhoek WG, Leck I, Aoki K, Ohno Y, Obata K. 1982. Artificial sweeteners and bladder cancer in Manchester, U.K. and Nagoya, Japan. *Br J Cancer* 45:332-336.
- Nakanishi K, Hirose M, Ogiso T, Hasegawa R, Arai M, Ito N. 1980. Effects of sodium saccharin and caffeine on the urinary bladder of rats treated with *N*-butyl-*N*-(4-hydroxybutyl)nitrosamine. *Gann* 71:490-500.
- Prasad O, Rai G. 1986. Induction of papillary adenocarcinoma of thyroid in albino mice by saccharin feeding. *Indian J Exp Biol* 24:197-199.
- Roe FJC, Levy LS, Carter RL. 1970. Feeding studies on sodium cyclamate, saccharin and sucrose for carcinogenic and tumor-promoting activity. *Food Cosmet Toxicol* 8:135-145.
- Schmähel D. 1973. Lack of carcinogenic effect of cyclamate, cyclohexylamine and saccharin in rats [in German]. *Arzneim Forsch* 23:1466-1470.
- Schmähel D, Habs M. 1984. Investigations on the carcinogenicity of the artificial sweeteners sodium cyclamate and sodium saccharin in rats in a two-generation experiment [in German]. *Arzneim Forsch* 34:604-608.
- Schoenig GP, Goldenthal EI, Geil RG, Frith CH, Richter WR, Carlborg FW. 1985. Evaluation of the dose response and *in utero* exposure to saccharin in the rat. *Food Chem Toxicol* 23:475-490.
- Sieber SM, Adamson RH. 1978. Long-term studies on the potential carcinogenicity of artificial sweeteners in non-human primates. In *Health and Sugar Substitutes*. Guggenheim B, ed. Basel, Switzerland: Karger. pp. 266-271.
- Sweatman TW, Renwick AG. 1979. Saccharin metabolism and tumorigenicity. *Science* 205:1019-1020.
- Sweatman TW, Renwick AG. 1980. The tissue distribution and pharmacokinetics of saccharin in the rat. *Toxicol Appl Pharmacol* 5:18-31.
- Taylor JM, Weinberger MA, Friedman L. 1980. Chronic toxicity and carcinogenicity to the urinary bladder of sodium saccharin in the *in utero*-exposed rat. *Toxicol Appl Pharmacol* 54:57-75.
- Thorgeirsson U, Dalgard D, Reeves J, Adamson R. 1994. Tumor incidence in a chemical carcinogenesis study of nonhuman primates. *Regul Toxicol Pharmacol* 19:130-151.
- Tisdell MO, Nees PO, Harris DL, Derser PH. 1974. Long-term feeding of saccharin in rats. In *Symposium: Sweeteners*. Inglett, GE, ed. Westport, CT: Avi Publishing Co. pp. 145-158.
- West RW, Sheldom WG, Gaylor DW, Haskin MG, Delongchamp RR, Kadlubar FF. 1986. The effects of saccharin on the development of neoplastic lesions initiated with *N*-methyl-*N*-nitrosourea in the rat urothelium. *Fundam Appl Toxicol* 7:585-600.
- Whysner J, Williams GM. 1996. Saccharin mechanistic data and risk assessment: urine composition, enhanced cell proliferation, and tumor promotion. *Pharmacol Ther* 71:225-252.

## Appendix C: Substances Reviewed but Not Recommended for Listing in the Report on Carcinogens

The following table contains a record of nominations that were formally considered for listing by the NTP and, after evaluation by the Report on Carcinogens review groups, were recommended not to be listed in the Report on Carcinogens.

Substance Name/ CAS Number	RoC Edition/ Review Date <sup>1</sup>	Reason for Not Listing	Review Document <sup>2</sup>
Methyl <i>tert</i> -butyl ether (MTBE) 1634-04-4	Ninth RoC 1998	Rodent cancer data were not sufficient.	<a href="https://ntp.niehs.nih.gov/ntp/newhomeroc/other/background/mtbe1_508.pdf">https://ntp.niehs.nih.gov/ntp/newhomeroc/other/background/mtbe1_508.pdf</a>
Nickel alloys	Tenth RoC 2000	Human data were inadequate, and rodent cancer data were not sufficient.	<a href="https://ntp.niehs.nih.gov/ntp/newhomeroc/roc10/ni_no_appendices_508.pdf">https://ntp.niehs.nih.gov/ntp/newhomeroc/roc10/ni_no_appendices_508.pdf</a>
Diethanolamine 111-42-2	Eleventh RoC 2002	Rodent cancer data were not sufficient.	<a href="https://ntp.niehs.nih.gov/ntp/newhomeroc/roc11/deapub_no_appendices_508.pdf">https://ntp.niehs.nih.gov/ntp/newhomeroc/roc11/deapub_no_appendices_508.pdf</a>
Monochloroacetic Acid 79-11-8	Fifteenth RoC 2018	Rodent cancer data were not sufficient.	<a href="https://ntp.niehs.nih.gov/go/HAA">https://ntp.niehs.nih.gov/go/HAA</a>
Trichloroacetic Acid 76-03-9	Fifteenth RoC 2018	Rodent cancer data were not sufficient.	<a href="https://ntp.niehs.nih.gov/go/HAA">https://ntp.niehs.nih.gov/go/HAA</a>
Light at Night	Fifteenth RoC 2020	It is uncertain whether the exposure circumstance meets the definition of "substance."	<a href="https://ntp.niehs.nih.gov/go/NSW_LAN">https://ntp.niehs.nih.gov/go/NSW_LAN</a>
Night Shift Work	Fifteenth RoC 2020	It is uncertain whether the exposure circumstance meets the definition of "substance."	<a href="https://ntp.niehs.nih.gov/go/NSW_LAN">https://ntp.niehs.nih.gov/go/NSW_LAN</a>

<sup>1</sup>Final background document or monograph.

<sup>2</sup>URL for the document or for the website from which the document can be accessed.

## Appendix D: 15th RoC and Monographs — Collaborators and Contributors

*National Institute of Environmental Health Sciences (NIEHS) /  
National Toxicology Program (NTP) Members*

**Rick Woychik, Ph.D.**

Director, NIEHS and NTP

**Brian R. Berridge, D.V.M., Ph.D., D.A.C.V.P.**

Associate Director, NTP

Scientific Director, Division of the NTP (DNTP)

**Ruth Lunn, Dr.P.H.**

Director, Office of the Report on Carcinogens (ORoC)

**Gloria Jahnke, D.V.M., D.A.B.T.**

Health Scientist, ORoC

**Suril S. Mehta, Dr.P.H.**

Health Scientist, ORoC

**H. S. Amy Wang, Ph.D.**

Health Scientist, ORoC

**John R. Bucher, Ph.D., D.A.B.T.**

Senior Scientist, DNTP

**Mary Wolfe, Ph.D.**

Deputy Program Director for Policy, DNTP

Director, NTP Office of Liaison, Policy, and Review

**Linda Birnbaum, Ph.D., D.A.B.T., A.T.S.**

Former Director, NIEHS and NTP (through 3 Oct 2019)

*Contract Support Staff for the RoC*

**Susan Dakin, Ph.D.**

Technical and Scientific Writing and Editing

Independent Consultant

Durham, NC

**Sanford Garner, Ph.D.**

Project Manager, Integrated Laboratory Systems (ILS), Inc.

**Whitney Arroyave, Ph.D.**

Epidemiologist, ILS, Inc.

**Stanley Atwood, M.S., D.A.B.T.**

Toxicologist, ILS, Inc.

**Ella Darden, B.S.**

Administrative Support Specialist, ILS, Inc.

**Andrew Ewens, Ph.D., D.A.B.T.**

Toxicologist, ILS, Inc.

**Jessica Geter, M.S.L.S.**

Information Specialist, ILS, Inc.

**Lara Handler, M.S.L.S.**

Information Specialist, ILS, Inc.

**Alton Peters, M.S.**

Environmental Scientist, ILS, Inc.

**Tracy Saunders, B.S.**

Administrative Support Specialist, ILS, Inc.

**Pamela Schwingl, Ph.D.**

Epidemiologist, ILS, Inc.

## Participants in Preparation and Review of RoC Monographs

*Antimony Trioxide*

*Provided Technical Input or Review*

**Melanie C. Buser, M.P.H.**

Agency for Toxic Substances and Disease Registry,  
Centers for Disease Control and Prevention (CDC)

**Stephen S. Ferguson, Ph.D.**

NTP Biomolecular Screening Branch (BSB)

**Gordon P. Flake, M.D.** (Deceased July 30, 2018)

NTP Cellular and Molecular Pathology Branch (CMPB)

**Kristina M. Hatlelid, Ph.D., M.P.H.**

Directorate for Health Sciences,

U.S. Consumer Product Safety Commission

**Michelle J. Hooth, Ph.D.**

NTP Program Operations Branch (POB)

**Jui-Hua Hsieh, Ph.D.**

NTP BSB

**B. Alex Merrick, Ph.D.**

NTP BSB

**Daniel L. Morgan, Ph.D.**

NTP Toxicology Branch

**Arun K. R. Pandiri, B.V.Sc, M.S., Ph.D.**

NTP CMPB

**Linda M. Sargent, Ph.D.**

Health Effects Laboratory Division, CDC

**Matthew D. Stout, Ph.D.**

NTP POB

**Kyla W. Taylor, Ph.D.**

NTP Office of Health Assessment and Translation (OHAT)

**Erik J. Tokar, Ph.D.**

NTP Laboratory Branch

**Joanne Trgovcich, Ph.D.**

Senior Technical Specialist, ICF, Inc.

**Suramya Waidyanatha, Ph.D.**

NTP POB

**Yin-tak Woo, Ph.D.**

Office of Chemical Safety and Pollution Prevention,  
U.S. Environmental Protection Agency (USEPA)

*Peer Review Panel*

**Rebecca Fry, Ph.D. (Chair)**

Gillings School of Global Public Health,

University of North Carolina at Chapel Hill

Chapel Hill, NC

**Richard Peterson II, D.V.M., Ph.D., D.A.C.V.P.**

AbbVie

Libertyville, IL

**Elaine Symanski, Ph.D.**

The University of Texas Health Science Center at Houston  
Houston, TX



*Report on Carcinogens, Fifteenth Edition*

**Elizabeth Ward, Ph.D.**

American Cancer Society  
Asheville, NC

**John Wise, Sr., Ph.D.**

University of Louisville  
Louisville, KY

**Hao Zhu, Ph.D.**

The Rutgers Center for Computational and Integrative Biology,  
Rutgers University  
Camden, NJ

***Haloacetic Acids Found as Water Disinfection By-Products***

*Provided Technical Input or Review*

**Scott Auerbach, Ph.D.**

NTP BSB

**Windy A. Boyd, Ph.D.**

NTP OHAT

**Michael Devito, Ph.D.**

NTP Laboratory Branch

**Stephen S. Ferguson, Ph.D.**

NTP BSB

**Michelle J. Hooth, Ph.D.**

NTP POB

**Scott A. Masten, Ph.D., D.A.B.T.**

NTP Office of Nomination and Selection (ONS)

**Arun K.R. Pandiri, B.V.Sc, M.S., Ph.D.**

NTP CMPB

**Grace Patlewicz, Ph.D.**

Center for Computational Toxicology, USEPA

**Kristen Ryan, Ph.D.**

NTP Toxicology Branch

**Jane Ellen Simmons, Ph.D.**

Pharmacokinetics Branch, USEPA

**Suramya Waidyanatha, Ph.D.**

NTP POB

**Nigel J. Walker, Ph.D., D.A.B.T.**

NTP Toxicology Branch

**Vickie R. Walker, B.S.**

NTP Toxicology Branch

*External Technical Advisors*

**Ron Melnick, Ph.D.**

Ron Melnick Consulting, LLC  
North Logan, UT

**Michael Plewa, Ph.D.**

University of Illinois at Urbana–Champaign  
Urbana, IL

**Susan Richardson, Ph.D.**

University of South Carolina  
Columbia, SC

*Peer Review Panel*

**Weihshueh Chiu, Ph.D. (Chair)**

Texas A&M University  
College Station, TX

**Mathias Attene Ramos, Ph.D.**

George Washington University  
Washington, DC

**Julia H. Carter, Ph.D.**

Wood Hudson Cancer Research Laboratory  
Newport, KY

**Lawrence H. Lash, Ph.D.**

Wayne State University School of Medicine  
Detroit, MI

**Shahid Parvez, Ph.D.**

Indiana University–Purdue University  
Indianapolis, IN

**Stephen M. Roberts, Ph.D.**

University of Florida  
Gainesville, FL

**Consolato Sergi, M.D., Ph.D., M.P.H, F.R.C.P.C.**

University of Alberta  
Edmonton, Alberta, Canada

**Susan C. Tilton, Ph.D.**

Oregon State University  
Corvallis, OR

***Helicobacter pylori (Chronic Infection)***

*Provided Technical Input or Review*

**Brandy Beverly, Ph.D.**

NTP OHAT

**Michelle J. Hooth, Ph.D.**

NTP POB

**David Malarkey, Ph.D.**

NTP CMPB

**Scott A. Masten, Ph.D., D.A.B.T.**

NTP ONS

**Charles Rabkin, M.D.**

Division of Cancer Epidemiology and Genetics,  
National Cancer Institute

*Peer Reviewers (By Letter)*

**Rolando Herrero, M.D., Ph.D.**

International Agency for Research on Cancer  
Lyon, France

**Julie Parsonnet, M.D.**

Stanford University Medical Center  
Stanford, CA

**Traci L. Testerman, Ph.D.**

University of South Carolina School of Medicine  
Columbia, SC

## **Appendix E: Chemicals Nominated to the NTP for In- Depth Toxicological Evaluation**

A searchable database of substances nominated to the NTP for toxicological testing is available on the NTP website at <http://ntp.niehs.nih.gov/go/nom-search>. The available information includes the substance nominated and the nomination date, source, rationale, and status. If NTP testing has been conducted, a link is provided to the results and status information. Nominations can be searched by substance name, Chemical Abstract Service Registry Number (CASRN) or keyword.

The Management Status Report (<http://ntp.niehs.nih.gov/go/MSR-index>) gives the status of substances selected for study using standard 2-week, 13-week, and/or 2-year toxicology and carcinogenicity protocols. Abstracts for all published NTP long-term carcinogenicity technical reports and short-term toxicity study reports are available electronically on the NTP Web site. To view the abstracts or download full reports, visit <http://ntp.niehs.nih.gov>.

For additional information about NTP studies, contact Central Data Management, Mail Drop K2-05, NIEHS, P.O. Box 12233, Research Triangle Park, NC 27709 (phone: 919-541-3419; e-mail: [CDM@niehs.nih.gov](mailto:CDM@niehs.nih.gov)).

## Appendix F: Substance Names and Common Synonyms

Appendix F contains a list of the substance names and common synonyms for substances listed in the Report on Carcinogens. This list includes both chemical names and common names as used in the substance profiles. This list is not intended to be an exhaustive listing of all possible alternative names or synonyms.

### A

**2-AAF** *see* 2-Acetylaminofluorene  
**ABP** *see* 4-Aminobiphenyl  
**ABVD therapy** *see* Dacarbazine  
**ADBAQ** *see* 1-Amino-2,4-dibromoanthraquinone  
**AFB1** *see* Aflatoxins  
**As** *see* Arsenic and Inorganic Arsenic Compounds  
**ATO** *see* Antimony Trioxide  
**5-AzaC** *see* Azacitidine  
**2-acetamidofluorene** *see* 2-Acetylaminofluorene  
**2-acetaminofluorene** *see* 2-Acetylaminofluorene  
**acetate blue G** *see* Disperse Blue 1  
**acetic aldehyde** *see* Acetaldehyde  
**acetothioamide** *see* Thioacetamide  
**acetylaldehyde** *see* Acetaldehyde  
**acetylhydride** *see* Acetaldehyde  
**acid red 114 (C.I.)** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethylbenzidine  
**aciniform carbon** *see* Soots  
**acrylic acid amide** *see* Acrylamide  
**actinolite** *see* Asbestos  
**actinon** *see* Ionizing Radiation, Radon  
**alcohol drinking** *see* Alcoholic Beverage Consumption  
**aluminum-beryllium alloy** *see* Beryllium and Beryllium Compounds  
***o*-aminoanisole** *see* *o*-Anisidine and Its Hydrochloride  
**2-aminoanisole hydrochloride** *see* *o*-Anisidine and Its Hydrochloride  
**2-aminoazotoluene** *see* *o*-Aminoazotoluene  
***p*-aminobiphenyl** *see* 4-Aminobiphenyl  
**2-amino-3,4-dimethylimidazo[4,5-*f*]quinoline** *see* Heterocyclic Amines (Selected)  
**2-amino-3,8-dimethylimidazo[4,5-*f*]quinoxaline** *see* Heterocyclic Amines (Selected)  
**4-aminodiphenyl** *see* 4-Aminobiphenyl  
***p*-aminodiphenyl** *see* 4-Aminobiphenyl  
***para*-aminodiphenyl** *see* 4-Aminobiphenyl  
**2-amino-3-methyl-3*H*-imidazo(4,5-*f*)quinoline** *see* Heterocyclic Amines (Selected), 2-Amino-3-methylimidazo[4,5-*f*]quinoline (IQ)  
**2-amino-1-methyl-6-phenylimidazo[4,5-*b*]pyridine** *see* Heterocyclic Amines (Selected)  
**2-amino-3-methylimidazo[4,5-*f*]quinoline** *see* Heterocyclic Amines (Selected)  
**4-[(4-aminophenyl)(4-imino-2,5-cyclohexadien-1-ylidene)methyl]-benzenamine, monohydrochloride** *see* Basic Red 9 Monohydrate  
**4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1*H*)-one** *see* Azacitidine  
**3-amino-1,2,4-triazol** *see* Amitrole

**aminotriazole** *see* Amitrole  
**amosite** *see* Asbestos  
**analgesic mixtures containing phenacetin** *see* Phenacetin and Analgesic Mixtures Containing Phenacetin  
**2-anisidine hydrochloride** *see* *o*-Anisidine and Its Hydrochloride  
**anthophyllite** *see* Asbestos  
**Aroclor 1016** *see* Polychlorinated Biphenyls  
**Aroclor 1221** *see* Polychlorinated Biphenyls  
**Aroclor 1242** *see* Polychlorinated Biphenyls  
**Aroclor 1248** *see* Polychlorinated Biphenyls  
**Aroclor 1254** *see* Polychlorinated Biphenyls  
**Aroclor 1260** *see* Polychlorinated Biphenyls  
**Aroclor 1262** *see* Polychlorinated Biphenyls  
**arsanilic acid** *see* Arsenic and Inorganic Arsenic Compounds  
**arsenate** *see* Arsenic and Inorganic Arsenic Compounds  
**arsenite** *see* Arsenic and Inorganic Arsenic Compounds  
**arsenous oxide** *see* Arsenic and Inorganic Arsenic Compounds  
**arsenous trichloride** *see* Arsenic and Inorganic Arsenic Compounds  
**arsine** *see* Arsenic and Inorganic Arsenic Compounds  
**5-azacytidine** *see* Azacitidine

### B

**B-1 glass fibers** *see* Certain Glass Wool Fibers (Inhalable)  
**B-09 glass fibers** *see* Certain Glass Wool Fibers (Inhalable)  
**B-20 glass fibers** *see* Certain Glass Wool Fibers (Inhalable)  
**BA** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benz[*a*]anthracene  
**B[*a*]P** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benzo[*a*]pyrene  
**BB-153 (hexabromobiphenyl)** *see* Polybrominated Biphenyls  
**B[*b*]F** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benzo[*b*]fluoranthene  
**BBMP** *see* 2,2-Bis(bromomethyl)-1,3-propanediol (Technical Grade)  
**BCME** *see* Bis(chloromethyl) Ether and Technical-Grade Chloromethyl Methyl Ether  
**BCNU** *see* Nitrosourea Chemotherapeutic Agents, Bis(chloroethyl) Nitrosourea  
**Be** *see* Beryllium and Beryllium Compounds  
**BHA** *see* Butylated Hydroxyanisole  
**B[*j*]F** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benzo[*j*]fluoranthene  
**B[*k*]F** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benzo[*k*]fluoranthene  
**basic fuchsin dye** *see* Basic Red 9 Monohydrochloride  
**basic red 9** *see* Basic Red 9 Monohydrochloride  
**basic zinc chromate** *see* Chromium Hexavalent Compounds  
**beer** *see* Alcoholic Beverage Consumption  
**1,2-benzanthracene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benz[*a*]anthracene  
**benz[*a*]anthracene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
**benz[*a*]anthracine** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benz[*a*]anthracene  
**benz[*e*]acephenanthrylene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Benzo[*b*]fluoranthene  
**benzidine dye class** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**benzo[*b*]fluoranthene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**benzo[*j*]fluoranthene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**benzo[*k*]fluoranthene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**benzoic trichloride** *see* Benzotrichloride

**benzol** *see* Benzene

**benzo[*rst*]pentaphene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,i*]pyrene

**benzo[*a*]pyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**beryl ore** *see* Beryllium and Beryllium Compounds

**beta-aminoanthraquinone** *see* 2-Aminoanthraquinone

**beta-naphthylamine** *see* 2-Naphthylamine

**bidis** *see* Tobacco-Related Exposures, Tobacco Smoking

**2,2'-bioxirane** *see* Diepoxybutane

**4-biphenylamine** *see* 4-Aminobiphenyl

**2,2-bis(bromomethyl)propane-1,3-diol** *see* 2,2-Bis(bromomethyl)-1,3-propanediol (Technical Grade)

**bischloroethyl nitrosourea** *see* Nitrosourea Chemotherapeutic Agents, Bis(chloroethyl) Nitrosourea

**bis(chloroethyl) nitrosourea** *see* Nitrosourea Chemotherapeutic Agents, Bis(chloroethyl) Nitrosourea

**4-[bis(2-chloroethyl)amino]-L-phenylalanine** *see* Melphalan

**4-[*p*]-[bis(2-chloroethyl)amino]phenyl]butyric acid** *see* Chlorambucil

**bis(2-chloroethyl)sulfide** *see* Mustard Gas

**4,4'-bis(dimethylamino)benzophenone** *see* Michler's Ketone

**bis(2-ethylhexyl) ester 1,2-benzenedicarboxylic acid** *see* Di(2-ethylhexyl) Phthalate

**bis(2-ethylhexyl phthalate)** *see* Di(2-ethylhexyl) Phthalate

**3,3-bis(4-hydroxyphenyl)-1-(3*H*)-isobenzofuranone** *see* Phenolphthalein

**broad-spectrum ultraviolet radiation** *see* Ultraviolet Radiation Related Exposures

**bromochloroacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**bromodichloroacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**bromoethene** *see* Vinyl Halides (Selected), Vinyl Bromide

**bromiodoacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**busulfan** *see* 1,4-Butanediol Dimethanesulfonate

**Busulfex** *see* 1,4-Butanediol Dimethanesulfonate

**1,3-butadiene diepoxide** *see* Diepoxybutane

**butane diepoxide** *see* Diepoxybutane

**1,4-butanediol dimethanesulphonate** *see* 1,4-Butanediol Dimethanesulfonate

**butter yellow** *see* 4-Dimethylaminoazobenzene

## C

**CAA** *see* Arsenic and Inorganic Arsenic Compounds and Chromium Hexavalent Compounds

**CCNU** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea

**Cd** *see* Cadmium and Cadmium Compounds

**CEP** *see* Epichlorohydrin

**C.I. 42500** *see* Basic Red 9 Monohydrochloride

**C.I. 64500** *see* Disperse Blue 1

**C.I. acid red 114** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. basic red monohydrochloride** *see* Basic Red 9 Monohydrochloride

**C.I. direct black 38** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**C.I. direct blue 1** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. direct blue 2** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**C.I. direct blue 6** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**C.I. direct blue 8** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. direct blue 14** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. direct blue 15** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. direct blue 76** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. direct blue 98** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. direct blue 218** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**C.I. direct brown 2** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**C.I. direct brown 95** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**C.I. direct green** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**C.I. direct red 28** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine

**C.I. disperse blue 1** *see* Disperse Blue 1

**C.I. pigment orange 16** *see* *o*-Aminoazotoluene

**C.I. solvent yellow 3** *see* *o*-Aminoazotoluene

**CMME** *see* Bis(chloromethyl) Ether and Technical-Grade Chloromethyl Methyl Ether

**Co** *see* Cobalt-Related Exposures, Cobalt and Cobalt Compounds That Release Cobalt Ions *In Vivo*

**Co/WC** *see* Cobalt-Related Exposures, Cobalt-Tungsten Carbide: Powders and Hard Metals

**calcium arsenate** *see* Arsenic and Inorganic Arsenic Compounds

**calcium arsenite** *see* Arsenic and Inorganic Arsenic Compounds

**calcium chromate** *see* Chromium Hexavalent Compounds

**camphechlor** *see* Toxaphene

**carbamic acid ethyl ester** *see* Urethane

**carbamodithioic acid, diethyl-, 2-chloro-2-propenyl ester** *see* Sulfallate

**carbon cenospheres** *see* Soots

**carbonaceous xerogol particles** *see* Soots

**carmustine** *see* Nitrosourea Chemotherapeutic Agents, Bis(chloroethyl) Nitrosourea



**cemented carbides** *see* Cobalt-Related Exposures, Cobalt–Tungsten Carbide: Powders and Hard Metals

**CertainTeed B glass fiber** *see* Certain Glass Wool Fibers (Inhalable)

**chewing tobacco** *see* Tobacco-Related Exposures, Smokeless Tobacco

**chinofer** *see* Iron Dextran Complex

**2-chlorallyl diethyldithiocarbamate** *see* Sulfallate

**chlordecone** *see* Kepone

**chlorethamine** *see* Nitrogen Mustard Hydrochloride

**chlorinated camphene** *see* Toxaphene

**4-chloro-1,2-benzenediamine** *see* 4-Chloro-*o*-phenylenediamine

**2-chloro-1,3-butadiene** *see* Chloroprene

**chlorocamphene** *see* Toxaphene

**2-chloro-*N*-(2-chloroethyl)-*N*-methylethanamine** *see* Nitrogen Mustard Hydrochloride

**chlorodibromoacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**1-chloro-2,3-dibromopropane** *see* 1,2-Dibromo-3-chloropropane

**3-chloro-1,2-dibromopropane** *see* 1,2-Dibromo-3-chloropropane

**chlorodiphenyls** *see* Polychlorinated Biphenyls

**1-chloro-2,3-epoxypropane** *see* Epichlorohydrin

**chloroethene** *see* Vinyl Halides (Selected), Vinyl Chloride

**1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea

**1-(2-chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea

**2-(((2-chloroethyl)nitrosoamino)carbonyl)amino)-2-deoxy-*D*-glucose** *see* Nitrosourea Chemotherapeutic Agents, Chlorozotocin

**chloroiodoacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**chloromethyl methyl ether** *see* Bis(chloromethyl) Ether and Technical-Grade Chloromethyl Methyl Ether

**chloromethyl oxirane** *see* Epichlorohydrin

**4-chloro-2-methylaniline** *see* *p*-Chloro-*o*-toluidine and Its Hydrochloride

**4-chloro-2-methylbenzenamine** *see* *p*-Chloro-*o*-toluidine and Its Hydrochloride

**4-chloro-2-methylbenzenamine hydrochloride** *see* *p*-Chloro-*o*-toluidine and Its Hydrochloride

**1-chloro-2-methylpropene** *see* Dimethylvinyl Chloride

**1-chloro-2-methyl-1-propene** *see* Dimethylvinyl Chloride

**3-chloro-2-methyl-1-propene** *see* 3-Chloro-2-methylpropene

**4-chloro-1,2-phenylenediamine** *see* 4-Chloro-*o*-phenylenediamine

**4-chloro-*o*-toluidine** *see* *p*-Chloro-*o*-toluidine and Its Hydrochloride

**4-chloro-*o*-toluidine hydrochloride** *see* *p*-Chloro-*o*-toluidine and Its Hydrochloride

**chlorozotocin** *see* Nitrosourea Chemotherapeutic Agents, Chlorozotocin

**chromated copper arsenate (CCA)** *see* Arsenic and Inorganic Arsenic Compounds and Chromium Hexavalent Compounds

**chromates** *see* Chromium Hexavalent Compounds

**chromic trioxide** *see* Chromium Hexavalent Compounds

**chromium VI** *see* Chromium Hexavalent Compounds

**chrysazin** *see* Danthron

**chrysotile** *see* Asbestos

**ciclosporin** *see* Cyclosporin A

**cigarettes** *see* Tobacco-Related Exposures, Tobacco Smoking

**cigars** *see* Tobacco-Related Exposures, Tobacco Smoking

***cis*-dichlorodiammine platinum (II)** *see* Cisplatin

***cis*-1,3-dichloropropene** *see* 1,3-Dichloropropene (Technical Grade)

**Clophen A** *see* Polychlorinated Biphenyls

**Clophens** *see* Polychlorinated Biphenyls

**coal tar distillates** *see* Coal Tars and Coal Tar Pitches

**cobalt** *see* Cobalt-Related Exposures, Cobalt and Cobalt Compounds That Release Cobalt Ions *In Vivo*

**coke and char fragments** *see* Soots

**conjugated estrogens** *see* Estrogens, Steroidal

**copper-beryllium alloy** *see* Beryllium and Beryllium Compounds

**cristobalite** *see* Silica, Crystalline (Respirable Size)

**crocidolite** *see* Asbestos

**crystalline quartz** *see* Silica, Crystalline (Respirable Size)

**crystalline silica, respirable** *see* Silica, Crystalline (Respirable Size)

**crystalline silicon dioxide** *see* Silica, Crystalline (Respirable Size)

**(*R*-(*R*\*,*R*\*-(*E*)))**-cyclic(L-alanyl-D-alanyl-*N*-methyl-L-leucyl-*N*-methyl-L-leucyl-*N*-methyl-L-valyl-3-hydroxy-*N*,4-dimethyl-L-2-amino-6-octenoyl-L- $\alpha$ -aminobutyryl-*N*-methylglycyl-*N*-methyl-L-leucyl-L-valyl-*N*-methyl-L-leucyl) *see* Cyclosporin A

**cyclosporine** *see* Cyclosporin A

## D

**DAAB** *see* Diazoaminobenzene

**DB[*a,e*]P** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,e*]pyrene

**DB[*a,h*]A** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,h*]anthracene

**DB[*a,h*]P** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,h*]pyrene

**DB[*a,h*]AC** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,h*]acridine

**DB[*a,i*]P** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,i*]pyrene

**DB[*a,j*]AC** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,j*]acridine

**DB[*a,l*]P** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[*a,l*]pyrene

**DBCP** *see* 1,2-Dibromo-3-chloropropane

**DBP** *see* 2,3-Dibromo-1-propanol

**DDT** *see* Dichlorodiphenyltrichloroethane

***o-o'*-DDT** *see* Dichlorodiphenyltrichloroethane

***o-p'*-DDT** *see* Dichlorodiphenyltrichloroethane

***p,p'*-DDT** *see* Dichlorodiphenyltrichloroethane

**DEHP** *see* Di(2-ethylhexyl) Phthalate

**DEN** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodiethylamine

**DES** *see* Diethylstilbestrol

**DMN** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodimethylamine

**dantron** *see* Danthron

**decabromobiphenyl** *see* Polybrominated Biphenyls

**1,1a,3,3a,4,5,5a,5b,6-decachlorooctahydro-1,3,4-metheno-2H-cyclobuta[*cd*]pentalen-2-one** *see* Kepone

**2-deoxy-2((methyl-nitrosoamino)carbonyl)amino)-*D*-glucopyranose** *see* Nitrosourea Chemotherapeutic Agents, Streptozotocin

**dextran iron complex** *see* Iron Dextran Complex

**4,4'-diaminobiphenyl** *see* Benzidine

**4,4'-diaminodiphenyl ether** *see* 4,4'-Oxydianiline



- diaminodiphenyl ether** *see* 4,4'-Oxydianiline
- 4,4'-diaminodiphenyl sulfide** *see* 4,4'-Thiodianiline
- 4,4'-diaminodiphenylmethane** *see* 4,4'-Methylenedianiline and Its Dihydrochloride
- o-dianisidine** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine
- diantimony trioxide** *see* Antimony Trioxide
- dibenz[*a,h*]acridine** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- dibenz[*a,j*]acridine** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- dibenz[*a,h*]anthracene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- 7H-dibenz[*c,g*]carbazole** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- dibenz[*b,c,e,f*]chrysene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenz[*a,h*]pyrene
- dibenzo[*def,p*]chrysene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenz[*a,l*]pyrene
- 1,2,4,5-dibenzopyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenz[*a,e*]pyrene
- 3,4,9,10-dibenzopyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenz[*a,i*]pyrene
- dibenzo[*a,e*]pyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- dibenzo[*a,h*]pyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- dibenzo[*a,i*]pyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- dibenzo[*a,l*]pyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings
- dibromoacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)
- 2,4-dibromo-1-anthraquinonylamine** *see* 1-Amino-2,4-dibromoanthraquinone
- dibromoneopentyl glycol** *see* 2,2-Bis(bromomethyl)-1,3-propanediol (Technical Grade)
- 2,3-dibromopropanol** *see* 2,3-Dibromo-1-propanol
- 2,3-dibromopropan-1-ol** *see* 2,3-Dibromo-1-propanol
- 2,3-dibromo-1-propanol phosphate (3:1)** *see* Tris(2,3-dibromopropyl) Phosphate
- dichloroacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)
- p*-dichlorobenzene** *see* 1,4-Dichlorobenzene
- 3,3'-dichloro-(1,1'-biphenyl)-4,4'-diamine** *see* 3,3'-Dichlorobenzidine and Its Dihydrochloride
- 3,3'-dichloro-(1,1'-biphenyl)-4,4'-diamine dihydrochloride** *see* 3,3'-Dichlorobenzidine and Its Dihydrochloride
- dichlorobromomethane** *see* Bromodichloromethane
- 2,2-dichloro-*N*-(2-hydroxy-1-(hydroxymethyl)-2-(4-nitrophenyl)ethyl)-, (R-(*R*<sup>\*</sup>,*R*<sup>\*</sup>))-nitrophenyl)ethyl)acetamide** *see* Chloramphenicol
- [R-(*R*<sup>\*</sup>,*R*<sup>\*</sup>))-2,2-dichloro-*N*-(2-hydroxy-1-(hydroxymethyl)-2-(4-nitrophenyl)ethyl)acetamide** *see* Chloramphenicol
- 2,4-dichloro-1-(4-nitrophenoxy)benzene** *see* Nitrofen
- 2,4-dichlorophenyl-*p*-nitrophenyl ether** *see* Nitrofen
- 1,3-dichloro-1-propene** *see* 1,3-Dichloropropene (Technical Grade)
- (*E*)-1,3-dichloropropene** *see* 1,3-Dichloropropene (Technical Grade)
- (*Z*)-1,3-dichloropropene** *see* 1,3-Dichloropropene (Technical Grade)
- dichromates** *see* Chromium Hexavalent Compounds
- 1,2,3,4-diepoxybutane** *see* Diepoxybutane
- diethyl ester sulfuric acid** *see* Diethyl Sulfate
- diethyl sulphate** *see* Diethyl Sulfate
- (*E*)-4,4'-(1,2-diethyl-1,2-ethenediyl)bisphenol** *see* Diethylstilbestrol
- diethylhexyl phthalate** *see* Di(2-ethylhexyl) Phthalate
- diethylnitrosamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodiethylamine
- Diethylstilboestrol** *see* Diethylstilbestrol
- Difolatan** *see* Captafol
- 2,3-dihydro-6-propyl-2-thioxo-4(1*H*)-pyrimidinone** *see* Propylthiouracil
- 1,8-dihydroxyanthraquinone** *see* Danthron
- diiodoacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)
- 1,3-diisocyanatomethylbenzene** *see* Toluene Diisocyanates
- Dilantin** *see* Phenytoin and Phenytoin Sodium
- 3,3'-dimethoxybenzidine dye class** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine
- dimethyl ester sulfuric acid** *see* Dimethyl Sulfate
- p*-dimethylaminoazobenzene** *see* 4-Dimethylaminoazobenzene
- para*-dimethylaminoazobenzene** *see* 4-Dimethylaminoazobenzene
- 4,4'-(dimethylamino)benzophenone** *see* Michler's Ketone
- 3,3'-dimethylbenzidine dye class** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethylbenzidine
- dimethylcarbamic chloride** *see* Dimethylcarbamoil Chloride
- (1,1-dimethylethyl)-4-methoxyphenol** *see* Butylated Hydroxyanisole
- 3,4-dimethyl-3*H*-imidazo[4,5-*f*]quinolin-2-amine** *see* Heterocyclic Amines (Selected), 2-Amino-3,4-dimethylimidazo[4,5-*f*]quinoline (MeIQ)
- 3,8-dimethyl-3*H*-imidazo[4,5-*f*]quinoxalin-2-amine** *see* Heterocyclic Amines (Selected), 2-Amino-3,8-dimethylimidazo[4,5-*f*]quinoxaline (MeIQx)
- dimethylnitrosamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodimethylamine
- 5-(3,3-dimethyl-1-triazenyl)1*H*-imidazole-4-carboxamide** *see* Dacarbazine
- 1,6-dinitropyrene** *see* Nitroarenes (Selected)
- 1,8-dinitropyrene** *see* Nitroarenes (Selected)
- dioctyl phthalate** *see* Di(2-ethylhexyl) Phthalate
- di-*sec*-octyl phthalate** *see* Di(2-ethylhexyl) Phthalate
- dioxin** *see* 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin
- diphenylan** *see* Phenytoin and Phenytoin Sodium
- (*Z*)-2-[4-(1,2-diphenyl-1-butenyl)phenoxy]-*N,N*-dimethylethanamine** *see* Tamoxifen
- diphenylhydantoin** *see* Phenytoin and Phenytoin Sodium
- 5,5-diphenylhydantoin** *see* Phenytoin and Phenytoin Sodium
- 1,2-diphenylhydrazine** *see* Hydrazobenzene
- 5,5-diphenyl-2,4-imidazolidinedione** *see* Phenytoin and Phenytoin Sodium
- 1,3-diphenyltriazene** *see* Diazoaminobenzene
- direct black 38 (C.I.)** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine
- direct blue 1 (C.I.)** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**direct blue 2 (C.I.)** *see* Benzidine and Dyes Metabolized to Benzidine  
**direct blue 6 (C.I.)** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine  
**direct blue 8 (C.I.)** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine  
**direct blue 14 (C.I.)** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethylbenzidine  
**direct blue 15 (C.I.)** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine  
**direct blue 76 (C.I.)** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine  
**direct blue 98 (C.I.)** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine  
**direct blue 218 (C.I.)** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine  
**direct brown 2 (C.I.)** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine  
**direct brown 95 (C.I.)** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine  
**direct green 6 (C.I.)** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine  
**direct red 28 (C.I.)** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine  
**disodium hydrogen arsenate** *see* Arsenic and Inorganic Arsenic Compounds  
**1,1a,2,2,3,3a,4,5,5a,5b,6-dodecachlorooctahydro-1,3,4-metheno-1H-cyclobuta(cd)pentalene** *see* Mirex  
**Dowicide EC-7** *see* Pentachlorophenol and By-products of Its Synthesis  
**doxorubicin hydrochloride** *see* Adriamycin  
**dyes metabolized to benzidine** *see* Benzidine and Dyes Metabolized to Benzidine, Dyes Metabolized to Benzidine  
**dyes metabolized to 3,3'-dimethoxybenzidine** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine  
**dyes metabolized to 3,3'-dimethylbenzidine** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethylbenzidine

## E

**EBV** *see* Viruses (Selected), Epstein-Barr Virus  
**EDB** *see* 1,2-Dibromoethane  
**ENU** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitroso-*N*-ethylurea  
**ETS** *see* Tobacco-Related Exposures, Environmental Tobacco Smoke  
**ETU** *see* Ethylene Thiourea  
**E-glass fibers** *see* Certain Glass Wool Fibers (Inhalable)  
**environmental tobacco smoke** *see* Tobacco-Related Exposures  
**1,2-epoxyethylbenzene** *see* Styrene-7,8-oxide  
**1-epoxyethyl-3,4-epoxycyclohexane** *see* 4-Vinyl-1-cyclohexene Diepoxide  
**estradiol** *see* Estrogens, Steroidal  
**estrogen hormone replacement therapy** *see* Estrogens, Steroidal  
**estrone** *see* Estrogens, Steroidal

**ethanal** *see* Acetaldehyde  
**ethanol** *see* Alcoholic Beverage Consumption  
**ethinylestradiol** *see* Estrogens, Steroidal  
**ethyl aldehyde** *see* Acetaldehyde  
**ethyl carbamate** *see* Urethane  
**ethyl methanesulphonate** *see* Ethylmethanesulfonate  
**ethylene dibromide** *see* 1,2-Dibromoethane  
**ethylene dichloride** *see* 1,2-Dichloroethane  
**ethylenethiourea** *see* Ethylene Thiourea  
**1-ethyl-1-nitroso-urea** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitroso-*N*-ethylurea  
**eugenol methyl ether** *see* Methyleugenol

## F

**FF-1** *see* Polybrominated Biphenyls  
**fast garnet GBC base** *see* *o*-Aminoazotoluene  
**ferrochromium** *see* Chromium Hexavalent Compounds  
**FG insulation fiberglass** *see* Certain Glass Wool Fibers (Inhalable)  
**FireMaster BP-6** *see* Polybrominated Biphenyls  
**FireMaster FF1** *see* Polybrominated Biphenyls  
**Firemaster t 23** *see* Tris(2,3-dibromopropyl) Phosphate  
**flavatoxin** *see* Aflatoxins  
**2-fluorenylacetylacetamide** *see* 2-Acetylaminofluorene  
**fluoroethene** *see* Vinyl Halides (Selected), Vinyl Fluoride  
**formalin** *see* Formaldehyde  
**Fosphenytoin** *see* Phenytoin and Phenytoin Sodium

## G

**gamma radiation** *see* Ionizing Radiation, X-Radiation and Gamma Radiation  
**gamma-hexachlorocyclohexane** *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers  
**glass code 104** *see* Certain Glass Wool Fibers (Inhalable)  
**glass code 108b** *see* Certain Glass Wool Fibers (Inhalable)  
**glass code 110** *see* Certain Glass Wool Fibers (Inhalable)  
**glass wool fiber B** *see* Certain Glass Wool Fibers (Inhalable)  
**glass wool fiber P** *see* Certain Glass Wool Fibers (Inhalable)  
**glass wool fiber V** *see* Certain Glass Wool Fibers (Inhalable)  
**glycidaldehyde** *see* Glycidol

## H

**HAAs** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)  
**HBV** *see* Viruses (Selected), Hepatitis B Virus  
**HCAAs** *see* Heterocyclic Amines (Selected)  
**HCH** *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers  
**HCV** *see* Viruses (Selected), Hepatitis C Virus  
**HHV-4** *see* Viruses (Selected), Epstein-Barr Virus  
**HHV-8** *see* Viruses (Selected), Kaposi Sarcoma-Associated Herpesvirus  
**HIV-1** *see* Viruses (Selected), Human Immunodeficiency Virus Type 1  
**HMPA** *see* Hexamethylphosphoramide  
**HPV** *see* Human Papillomaviruses: Some Genital-Mucosal Types  
***H. pylori*** *see* *Helicobacter pylori* (chronic infection)

**HTLV-1** *see* Viruses (Selected), Human T-Cell Lymphotropic Virus Type 1

**7H-DB[c,g]C** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, 7H-Dibenzo[c,g]carbazole

**7H-dibenzo[c,g]carbazole** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**hard metals** *see* Cobalt-Related Exposures, Cobalt–Tungsten Carbide: Powders and Hard Metals

**heptabromobiphenyls** *see* Polybrominated Biphenyls

**heptachlorobiphenyls** *see* Polychlorinated Biphenyls

**hexabromobiphenyls** *see* Polybrominated Biphenyls

**1,4,5,6,7,7-hexa-chlorobicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid** *see* Chlorendic Acid

**hexachlorobiphenyls** *see* Polychlorinated Biphenyls

**hexachlorocyclohexane** *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers

**$\gamma$ -hexachlorocyclohexane** *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers

**hexachlorocyclohexane isomers** *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers

**hexamethylphosphoric triamide** *see* Hexamethylphosphoramide

**hexavalent chromium compounds** *see* Chromium Hexavalent Compounds

**human herpesvirus 4** *see* Epstein-Barr Virus

**human herpesvirus 8** *see* Kaposi Sarcoma-Associated Herpesvirus

**14-hydroxydaunomycin** *see* Adriamycin

**17-hydroxy-2-(hydroxymethylene)-17-methyl-5 $\alpha$ ,17 $\beta$ -androstan-3-one** *see* Oxymetholone

**(17 $\alpha$ )-17-hydroxy-19-norpregn-4-en-20-yn-3-one** *see* Norethisterone

I

**IP** *see* Indeno[1,2,3-cd]pyrene

**IQ** *see* Heterocyclic Amines (Selected), 2-Amino-3-methylimidazo[4,5-f]quinoline

**2-imidazolidinethione** *see* Ethylene Thiourea

**indeno[1,2,3-cd]pyrene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**Infed** *see* Iron Dextran Complex

**inorganic acid mists** *see* Strong Inorganic Acid Mists Containing Sulfuric Acid

**insulation glass fibers** *see* Certain Glass Wool Fibers (Inhalable)

**involuntary smoking** *see* Tobacco-Related exposure, Environmental Tobacco Smoke

**iron-carbohydrate complexes** *see* Iron Dextran Complex

**isocyanic acid** *see* Toluene Diisocyanates

**isopropylbenzene** *see* Cumene

J

**JM 104/475 glass fibers** *see* Certain Glass Wool Fibers (Inhalable)

K

**KSHV** *see* Viruses (Selected), Kaposi Sarcoma–Associated Herpesvirus

**Kanechlor 500** *see* Polychlorinated Biphenyls

L

**lead acetate** *see* Lead and Lead Compounds

**lead arsenate** *see* Arsenic and Inorganic Arsenic Compounds

**lead chromates** *see* Chromium Hexavalent Compounds and Lead and Lead Compounds

**lead phosphate** *see* Lead and Lead Compounds

**lomustine** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea

**lubricant base oils** *see* Mineral Oils: Untreated and Mildly Treated

M

**MBOCA** *see* 4,4'-Methylenebis(2-chloroaniline)

**5-MC** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, 5-Methylchrysene

**MCpYV** *see* Viruses (Selected), Merkel Cell Polyomavirus

**MCV** *see* Viruses (Selected), Merkel Cell Polyomavirus

**MeCCNU** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea

**MeIQ** *see* Heterocyclic Amines (Selected), 2-Amino-3,4-dimethylimidazo[4,5-f]quinoline

**MeIQx** *see* Heterocyclic Amines (Selected), 2-Amino-3,8-dimethylimidazo[4,5-f]quinoxaline

**MMVF 33 glass fibers** *see* Certain Glass Wool Fibers (Inhalable)

**MMVF 10** *see* Certain Glass Wool Fibers (Inhalable)

**MMVF 10a** *see* Certain Glass Wool Fibers (Inhalable)

**MMVF 11** *see* Certain Glass Wool Fibers (Inhalable)

**MNNG** *see* N-Nitrosamines: 15 Listings, N-Methyl-N'-nitro-N-nitrosoguanidine

**MOCA** *see* 4,4'-Methylenebis(2-chloroaniline)

**MOPP** *see* Nitrogen Mustard Hydrochloride and Procarbazine and Its Hydrochloride

**MVNA** *see* N-Nitrosamines: 15 Listings, N-Nitrosomethylvinylamine

**magenta dye** *see* Basic Red 9 Monohydrochloride

**mainstream smoke** *see* Tobacco-Related Exposures, Environmental Tobacco Smoke

**man-made mineral fibers** *see* Ceramic Fibers (Respirable Size) and Certain Glass Wool Fibers (Inhalable)

**man-made vitreous fibers** *see* Ceramic Fibers (Respirable Size)

**Manville 901 glass fiber** *see* Certain Glass Wool Fibers (Inhalable)

**mechlorethamine** *see* Nitrogen Mustard Hydrochloride

**mechlorethamine hydrochloride** *see* Nitrogen Mustard Hydrochloride

**mestranol** *see* Estrogens, Steroidal

**metallic arsenic** *see* Arsenic and Inorganic Arsenic Compounds

**metallic nickel** *see* Nickel Compounds and Metallic Nickel

**methallyl chloride** *see* 3-Chloro-2-methylpropene

**2-methoxybenzenamine** *see* o-Anisidine and Its Hydrochloride

**4-methoxy-1,3-benzenediamine** *see* 2,4-Diaminoanisole Sulfate

**9-methoxy-7H-furo [3,2g] [1] benzopyran-7-one** *see* Methoxsalen with Ultraviolet A Therapy

**2-methoxy-5-methylbenzenamine** *see* p-Cresidine

**1-methoxy-2-nitrobenzene** *see* o-Nitroanisole

**4-methoxy-m-phenylenediamine sulfate** *see* 2,4-Diaminoanisole Sulfate

**8-methoxypsoralen** *see* Methoxsalen with Ultraviolet A Therapy

**methyl chloromethyl ether** *see* Bis(chloromethyl) Ether and Technical-Grade Chloromethyl Methyl Ether

**methyl ester methanesulfonic acid** *see* Methyl Methanesulfonate

**methyl eugenol** *see* Methyleugenol



**methyl 18 $\beta$ -hydroxy-11,17 $\alpha$ -dimethoxy-3 $\beta$ ,20 $\alpha$ -yohimban-16 $\beta$ -carboxylate 3,4,5-trimethoxybenzoate (ester)** *see* Reserpine

**2-methylbenzenamine** *see* *o*-Toluidine

**4-methyl-1,3-benzenediamine** *see* 2,4-Diaminotoluene

**2-methyl-1,3-butadiene** *see* Isoprene

**methyl-CCNU** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea

**5-methylchrysene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**methylene-bis-*o*-chloroaniline** *see* 4,4'-Methylenebis(2-chloroaniline)

**3-methyl-3*H*-imidazo[4,5-*f*]quinolin-2-amine** *see* Heterocyclic Amines (Selected), 2-Amino-3-methylimidazo[4,5-*f*]quinoline (IQ)

**2-methyl-4-[(2-methylphenyl)azo]-benzenamine** *see* *o*-Aminoazotoluene

**2-methyl-5-nitro-1*H*-imidazole-1-ethanol** *see* Metronidazole

**6-[(1-methyl-4-nitro-1*H*-imidazol-5-yl)thio]-1*H*-purine** *see* Azathioprine

**1-methyl-3-nitro-1-nitrosoguanidine** *see* *N*-Nitrosamines: 15 Listings, *N*-Methyl-*N'*-nitro-*N*-nitrosoguanidine

**4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone** *see* *N*-Nitrosamines: 15 Listings, 4-(*N*-Nitrosomethylamino)-1-(3-pyridyl)-1-butanone

**2-methyloxirane** *see* Propylene Oxide

**methyl-*m*-phenylene ester** *see* Toluene Diisocyanates

**1-methyl-6-phenyl-1*H*-imidazo[4,5-*b*]pyridin-2-amine** *see* Heterocyclic Amines (Selected), 2-Amino-1-methyl-6-phenylimidazo[4,5-*b*]pyridine (PhIP)

**methylene chloride** *see* Dichloromethane

**4,4'-methylenebisbenzenamine** *see* 4,4'-Methylenedianiline and Its Dihydrochloride

**4,4'-methylenebisbenzenamine dihydrochloride** *see* 4,4'-Methylenedianiline and Its Dihydrochloride

**4,4'-methylenebis(2-chlorobenzenamine)** *see* 4,4'-Methylenebis(2-chloroaniline)

**methylenedianiline dihydrochloride** *see* 4,4'-Methylenedianiline and Its Dihydrochloride

**4,4'-methylenedianiline dihydrochloride** *see* 4,4'-Methylenedianiline and Its Dihydrochloride

**4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone** *see* *N*-Nitrosamines: 15 Listings, 4-(*N*-Nitrosomethylamino)-1-(3-pyridyl)-1-butanone

**methyloxirane** *see* Propylene Oxide

**Michler's base** *see* 4,4'-Methylenebis(*N,N*-dimethyl)benzenamine

**mildly treated mineral oils** *see* Mineral Oils: Untreated and Mildly Treated

**mists, strong inorganic acid** *see* Strong Inorganic Acid Mists Containing Sulfuric Acid

**monobromoacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**monochloroacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**monoiodoacetic acid** *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)

**Myleran** *see* 1,4-Butanediol Dimethanesulfonate

## N

**NDEA** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodiethylamine

**NEU** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitroso-*N*-ethylurea

**Ni** *see* Nickel Compounds and Metallic Nickel

**NMU** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitroso-*N*-methylurea

**NNK** *see* *N*-Nitrosamines: 15 Listings, 4-(*N*-Nitrosomethylamino)-1-(3-pyridyl)-1-butanone

**NNN** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrososornicotine

***N*-butyl-*N*-nitroso-1-butamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodi-*n*-butylamine

***N*-(2-chloroethyl)-*N'*-cyclohexyl-*N*-nitrosourea** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea

***N*-dibutylnitrosoamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodi-*n*-butylamine

***N*-(4-ethoxyphenyl)acetamide** *see* Phenacetin and Analgesic Mixtures Containing Phenacetin

***N*-ethyl-*N*-nitroso-ethanamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodiethylamine

***N*-ethyl-*N*-nitrosourea** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitroso-*N*-ethylurea

***N*-2-fluorenylacetamide** *see* 2-Acetylaminofluorene

***N*-fluoren-2-yl-acetamide** *see* 2-Acetylaminofluorene

***N*-methyl-*N'*-nitro-*N*-nitrosoguanidine** *see* *N*-Nitrosamines: 15 Listings, *N*-Methyl-*N'*-nitro-*N*-nitrosoguanidine

***N*-methyl-*N*-nitroso-ethenylamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosomethylvinylamine

***N*-methyl-*N*-nitroso-glycine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrososarcosine

***N*-methyl-*N*-nitrosomethanamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodimethylamine

***N*-methyl-*N*-nitrosourea** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitroso-*N*-methylurea

***N*-(1-methylethyl)-4-[(2-methylhydrazino)methyl]-benzamide monohydrochloride** *see* Procarbazine and Its Hydrochloride

***N*-methylvinylnitrosamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosomethylvinylamine

***N,N*-bis(carboxymethyl)glycine** *see* Nitritotriacetic Acid

***N,N'*-bis(2-chloroethyl)-*N*-nitrosourea** *see* Nitrosourea Chemotherapeutic Agents, Bis(chloroethyl) Nitrosourea

***N,N*-bis(2-chloroethyl)tetrahydro-2*H*-1,3,2-oxaphosphorin-2-amine, 2-oxide monohydrate** *see* Cyclophosphamide

***N,N*-dibutylnitrosoamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodi-*n*-butylamine

***N,N*-diethyldithiocarbamic acid 2-choroallyl ester** *see* Sulfallate

***N,N*-dimethyl-4-aminoazobenzene** *see* 4-Dimethylaminoazobenzene

***N,N*-dimethyl-4-(phenylazo)-benzenamine** *see* 4-Dimethylaminoazobenzene

***N*-nitrosodi-*n*-butylamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodi-*n*-butylamine

***N*-nitrosodiethanolamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodiethanolamine

***N*-nitrosodiethylamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodiethylamine

***N*-nitrosodimethylamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodimethylamine

***N*-nitrosodipropylamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodi-*n*-propylamine

***N*-nitrosodipropylamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodi-*n*-propylamine

***N*-nitrosodi-*n*-propylamine** *see* *N*-Nitrosamines: 15 Listings, *N*-Nitrosodi-*n*-propylamine

**N-nitrosoethylurea** *see* N-Nitrosamines: 15 Listings, N-Nitroso-N-ethylurea

**N-nitroso-N-ethylurea** *see* N-Nitrosamines: 15 Listings, N-Nitroso-N-ethylurea

**4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone** *see* N-Nitrosamines: 15 Listings, 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone

**N-nitroso-N-methylglycine** *see* N-Nitrosamines: 15 Listings, N-Nitrososarcosine

**N-nitrosomethylurea** *see* N-Nitrosamines: 15 Listings, N-Nitroso-N-methylurea

**N-nitroso-N-methylurea** *see* N-Nitrosamines: 15 Listings, N-Nitroso-N-methylurea

**N-nitrosomethylvinylamine** *see* N-Nitrosamines: 15 Listings, N-Nitrosomethylvinylamine

**N-nitrosomorpholine** *see* N-Nitrosamines: 15 Listings, N-Nitrosomorpholine

**N-nitrosornicotine** *see* N-Nitrosamines: 15 Listings, N-Nitrosornicotine

**N-nitrosopiperidine** *see* N-Nitrosamines: 15 Listings, N-Nitrosopiperidine

**N-nitroso-N-propyl-1-propanamine** *see* N-Nitrosamines: 15 Listings, N-Nitrosodi-n-propylamine

**N-nitrosopyrrolidine** *see* N-Nitrosamines: 15 Listings, N-Nitrosopyrrolidine

**N-nitrososarcosine** *see* N-Nitrosamines: 15 Listings, N-Nitrososarcosine

**n-propyl bromide** *see* 1-Bromopropane

**6-n-propylthiouracil** *see* Propylthiouracil

**naphtho(1,2,3,4-def)chrysene** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings, Dibenzo[a,e]pyrene

**β-naphthylamine** *see* 2-Naphthylamine

**beta-naphthylamine** *see* 2-Naphthylamine

**neutrons** *see* Ionizing Radiation

**nickelocene** *see* Nickel Compounds and Metallic Nickel

**niclofen** *see* Nitrofen

**2-nitroanisole** *see* o-Nitroanisole

**nitrochlor** *see* Nitrofen

**6-nitrochrysene** *see* Nitroarenes (Selected)

**nitrogen mustard** *see* Nitrogen Mustard Hydrochloride

**nitropyrene** *see* Nitroarenes (Selected)

**1-nitropyrene** *see* Nitroarenes (Selected)

**4-nitropyrene** *see* Nitroarenes (Selected)

**nitrosodibutylamine** *see* N-Nitrosamines: 15 Listings, N-Nitrosodi-n-butylamine

**2,2'-(nitrosoimino)bis[ethanol]** *see* N-Nitrosamines: 15 Listings, N-Nitrosodiethanolamine

**4-nitrosomorpholine** *see* N-Nitrosamines: 15 Listings, N-Nitrosomorpholine

**1-nitroso-piperidine** *see* N-Nitrosamines: 15 Listings, N-Nitrosopiperidine

**1-nitrosopyrrolidine** *see* N-Nitrosamines: 15 Listings, N-Nitrosopyrrolidine

**3-(1-nitroso-2-pyrrolidinyl)pyridine** *see* N-Nitrosamines: 15 Listings, N-Nitrosornicotine

**2-nitrotoluene** *see* o-Nitrotoluene

**norethindrone** *see* Norethisterone

O

**o-aminoanisole** *see* o-Anisidine and Its Hydrochloride

**o-dianisidine** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine, Dyes Metabolized to 3,3'-Dimethoxybenzidine

**o-o'-DDT** *see* Dichlorodiphenyltrichloroethane

**o-p'-DDT** *see* Dichlorodiphenyltrichloroethane

**o-tolidine** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethylbenzidine

**octabromobiphenyl** *see* Polybrominated Biphenyls

**Oleum** *see* Strong Inorganic Acid Mists Containing Sulfuric Acid

**orthoarsenic acid** *see* Arsenic and Inorganic Compounds

**Owens-Corning FG insulation fiberglass with binder** *see* Certain Glass Wool Fibers (Inhalable)

**Owens-Corning FM series air filter media** *see* Certain Glass Wool Fibers (Inhalable)

**Owens-Corning glass wool** *see* Certain Glass Wool Fibers (Inhalable)

**1,2-oxathiolane, 2,2-dioxide** *see* 1,3-Propane Sultone

**2-oxetanone** *see* β-Propiolactone

**oxirane** *see* Ethylene Oxide

**oxiranemethanol** *see* Glycidol

**3-oxiranyl-7-oxabicyclo[4.1.0]heptane** *see* 4-Vinyl-1-cyclohexene Diepoxide

**4,4'-oxybisbenzenamine** *see* 4,4'-Oxydianiline

P

**PAHs** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**Pb** *see* lead

**PBBs** *see* Polybrominated Biphenyls

**PCBs** *see* Polychlorinated Biphenyls

**PCDD** *see* 2,3,7,8-Tetrachlorodibenzo-p-dioxin

**PCP** *see* Pentachlorophenol and By-products of Its Synthesis

**PhIP** *see* Heterocyclic Amines (Selected), 2-Amino-1-methyl-6-phenylimidazo-[4,5-b]pyridine

**PROP** *see* Propylthiouracil

**PUVA** *see* Methoxsalen with Ultraviolet A Therapy

**p-aminobiphenyl** *see* 4-Aminobiphenyl

**p-aminodiphenyl** *see* 4-Aminobiphenyl

**p-dichlorobenzene** *see* 1,4-Dichlorobenzene

**p-dimethylaminoazobenzene** *see* 4-Dimethylaminoazobenzene

**p-rosaniline hydrochloride** *see* Basic Red 9 Monohydrochloride

**p,p'-DDT** *see* Dichlorodiphenyltrichloroethane

**p,p'-tetramethyldiaminodiphenylmethane** *see* 4,4'-Methylenebis(N,N-dimethyl)benzenamine

**para-aminodiphenyl** *see* 4-Aminobiphenyl

**para-dimethylaminoazobenzene** *see* 4-Dimethylaminoazobenzene

**paraffins, chlorinated** *see* Chlorinated Paraffins

**paraformaldehyde** *see* Formaldehyde

**pararosanine hydrochloride** *see* Basic Red 9 Monohydrochloride

**passive smoke** *see* Tobacco-Related Exposures, Environmental Tobacco Smoke

**pentabromobiphenyl** *see* Polybrominated Biphenyls

**pentachlorobiphenyl** *see* Polychlorinated Biphenyls

**perc** *see* Tetrachloroethylene

**perchloroethylene** *see* Tetrachloroethylene



**petroleum** *see* Mineral Oils: Untreated and Mildly Treated

**1-phenylalanine**, *N*-[(5-chloro-3,4-dihydro-8-hydroxy-3-methyl-1-oxo-1*H*-2-benzopyran-7-yl)-carbonyl]-, (*R*)- *see* Ochratoxin A

**3-phenylazo-2,6-diaminopyridine hydrochloride** *see* Phenazopyridine Hydrochloride

**3-(phenylazo)-2,6-pyridinediamine monohydrochloride** *see* Phenazopyridine Hydrochloride

**2,2'-[phenylenebis(oxyethylene)]bisoxirane** *see* Diglycidyl Resorcinol Ether

**phenyloxirane** *see* Styrene-7,8-oxide

**1,1',1''-phosphinothioylidynetrisaziridine** *see* Thiotepa

**phthalate esters** *see* Di(2-ethylhexyl) Phthalate

**pigment orange 16 (C.I.)** *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine

**pipe smoking** *see* Tobacco-Related Exposures

**piperazine estrone sulfate** *see* Estrogens, Steroidal

**platinum** *see* Cisplatin

**polychlorinated camphenes** *see* Toxaphene

**polychlorocamphene** *see* Toxaphene

**polychlorophenols** *see* 2,4,6-Trichlorophenol

**polynuclear aromatic hydrocarbons** *see* Polycyclic Aromatic Hydrocarbons: 15 Listings

**potassium arsenate** *see* Arsenic and Inorganic Arsenic Compounds

**potassium arsenite** *see* Arsenic and Inorganic Arsenic Compounds

**potassium chromate** *see* Chromium Hexavalent Compounds

**potassium dichromate** *see* Chromium Hexavalent Compounds

**pregn-4-ene-3,20-dione** *see* Progesterone

**progesterin** *see* Progesterone

**propane sultone** *see* 1,3-Propane Sultone

**2-propenamide** *see* Acrylamide

**2-propenenitrile** *see* Acrylonitrile

**5-(2-propenyl)-1,3-benzodioxole** *see* Safrole

***n*-propyl bromide** *see* 1-Bromopropane

**6-propyl-2-thiouracil** *see* Propylthiouracil

**6-*n*-propylthiouracil** *see* Propylthiouracil

**propylenimine** *see* 2-Methylaziridine

**psoralen** *see* Methoxsalen with Ultraviolet A Therapy

**pyridium** *see* Phenazopyridine Hydrochloride

## Q

**quartz** *see* Silica, Crystalline (Respirable Size)

## R

**Rn** *see* Ionizing Radiation, Radon

**radon** *see* Ionizing Radiation, Radon

**refractory ceramic fibers** *see* Ceramic Fibers (Respirable Size)

**resorcinol diglycidyl ether** *see* Diglycidyl Resorcinol Ether

**respirable crystalline silica** *see* Silica, Crystalline (Respirable Size)

***p*-rosaniline hydrochloride** *see* Basic Red 9 Monohydrochloride

## S

**SCCP** *see* Chlorinated Paraffins

**sawdust** *see* Wood Dust

**Schleicher and Schuell (S&S 106) glass wool fibers** *see* Certain Glass Wool Fibers (Inhalable)

**secondhand smoke** *see* Tobacco-Related Exposures, Environmental Tobacco Smoke

**Selsun** *see* Selenium Sulfide

**semustine** *see* Nitrosourea Chemotherapeutic Agents, 1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea

**short-chain chlorinated paraffins** *see* Chlorinated Paraffins

**sidestream smoke** *see* Tobacco-Related Exposures, Environmental Tobacco Smoke

**sintered carbides** *see* Cobalt-Related Exposures, Cobalt-Tungsten Carbide: Powders and Hard Metals

**smokeless tobacco** *see* Tobacco-Related Exposures

**snuff** *see* Tobacco-Related Exposures, Smokeless Tobacco

**sodium arsenate** *see* Arsenic and Inorganic Arsenic Compounds

**sodium arsenite** *see* Arsenic and Inorganic Arsenic Compounds

**sodium chromate** *see* Chromium Hexavalent Compounds

**sodium dichromate** *see* Chromium Hexavalent Compounds

**sodium equilin sulfate** *see* Estrogens, Steroidal

**sodium estrone sulfate** *see* Estrogens, Steroidal

**solar radiation** *see* Ultraviolet Radiation Related Exposures

**solvent yellow 3 (C.I.)** *see* *o*-Aminoazotoluene

**special-purpose glass fibers** *see* Certain Glass Wool Fibers (Inhalable)

**spirits** *see* Alcoholic Beverage Consumption

**steroidal estrogens** *see* Estrogens, Steroidal

**stilbestrol** *see* Diethylstilbestrol

**streptozotocin** *see* Nitrosourea Chemotherapeutic Agents, Streptozotocin

**strontium chromate** *see* Chromium Hexavalent Compounds

**styrene oxide** *see* Styrene-7,8-oxide

**sulfur mustard** *see* Mustard Gas

**sulfuric acid** *see* Strong Inorganic Acid Mists Containing Sulfuric Acid

**sunbeds** *see* Ultraviolet Radiation Related Exposures, Sunlamps or Sunbeds, Exposure to

**sunlamps** *see* Ultraviolet Radiation Related Exposures

**synthetic mineral fibers** *see* Ceramic Fibers (Respirable Size) and Certain Glass Wool Fibers (Inhalable)

**synthetic vitreous fibers** *see* Certain Glass Wool Fibers (Inhalable)

## T

**TCDD** *see* 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin

**2,3,7,8-TCDD** *see* 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin

**TCE** *see* Trichloroethylene

**TDI** *see* Toluene Diisocyanates

**TEPA** *see* Thiotepa

**TFE** *see* Tetrafluoroethylene

**TRIS** *see* Tris(2,3-dibromopropyl) Phosphate

**Telone II** *see* 1,3-Dichloropropene (Technical Grade)

**Tempstran code 100/475 glass fibers** *see* Certain Glass Wool Fibers (Inhalable)

**2-*tert*-butyl-4-hydroxyanisole (2-BHA)** *see* Butylated Hydroxyanisole

**3-*tert*-butyl-4-hydroxyanisole (3-BHA)** *see* Butylated Hydroxyanisole

**1,4,5,8-tetraaminoanthraquinone** *see* Disperse Blue 1

**tetrachlorobiphenyl** *see* Polychlorinated Biphenyls

**tetrachloroethene** *see* Tetrachloroethylene

**tetrachloromethane** *see* Carbon Tetrachloride

**tetraethyl lead** *see* Lead and Lead Compounds

**tetrafluoroethene** *see* Tetrafluoroethylene  
**tetramethyl lead** *see* Lead and Lead Compounds  
***p,p'*-tetramethyldiaminodiphenylmethane** *see*  
4,4'-Methylenebis(*N,N*-Dimethyl)benzenamine  
**4,4'-thiobisbenzenamine** *see* 4,4'-Thiodianiline  
**1,1'-thiobis(2-chloroethane)** *see* Mustard Gas  
**thiodianiline** *see* 4,4'-Thiodianiline  
**thorium dioxide** *see* Ionizing Radiation  
**thorium oxide** *see* Ionizing Radiation, Thorium Dioxide  
**thoron** *see* Ionizing Radiation, Radon  
**Thorotrast** *see* Ionizing Radiation, Thorium Dioxide  
**tobacco smoking** *see* Tobacco-Related Exposures  
***o*-tolidine** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to  
3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethylbenzidine  
**2,4-toluene diisocyanate** *see* Toluene Diisocyanates  
**2,6-toluene diisocyanate** *see* Toluene Diisocyanates  
**toluenediamine** *see* 2,4-Diaminotoluene  
**tolylene diisocyanate** *see* Toluene Diisocyanates  
***trans*-1,3-dichloropropene** *see* 1,3-Dichloropropene (Technical  
Grade)  
**tremolite** *see* Asbestos  
**tribromoacetic acid** *see* Haloacetic Acids Found as Water  
Disinfection By-products (Selected)  
**trichloroacetic acid** *see* Haloacetic Acids Found as Water  
Disinfection By-products (Selected)  
**1,1,1-trichloro-2,2-bis(*p*-chlorophenyl) ethane** *see*  
Dichlorodiphenyltrichloroethane  
**trichloroethene** *see* Trichloroethylene  
**1,1,2-trichloroethene** *see* Trichloroethylene  
**trichloromethane** *see* Chloroform  
**1-(trichloromethyl)benzene** *see* Benzotrichloride  
 **$\alpha,\alpha,\alpha$ -trichlorotoluene** *see* Benzotrichloride  
**tridymite** *see* Silica, Crystalline (Respirable Size)  
**triethylenethiophosphoramidate** *see* Thiotepa  
**trimethylene methanesulfonate** *see* 1,4-Butanediol  
Dimethanesulfonate  
**trioxane** *see* Formaldehyde  
**tris(1-aziridinyl)phosphine sulfide** *see* Thiotepa  
**trypan blue** *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to  
3,3'-Dimethylbenzidine, Dyes Metabolized to 3,3'-Dimethylbenzidine  
**tungsten carbides** *see* Cobalt-Related Exposures, Cobalt-Tungsten  
Carbide: Powders and Hard Metals

## U

**UMDH** *see* 1,1-Dimethylhydrazine  
**UVA** *see* Ultraviolet Radiation Related Exposures  
**UVB** *see* Ultraviolet Radiation Related Exposures  
**UVC** *see* Ultraviolet Radiation Related Exposures  
**UVR** *see* Ultraviolet Radiation Related Exposures  
**unsymmetrical dimethylhydrazine** *see* 1,1-Dimethylhydrazine  
**untreated mineral oils** *see* Mineral Oils: Untreated and Mildly  
Treated  
**urethan** *see* Urethane

## V

**Vidaza** *see* Azacitidine  
**vinyl bromide** *see* Vinyl Halides (Selected), Vinyl Bromide  
**vinyl chloride** *see* Vinyl Halides (Selected), Vinyl Chloride  
**4-vinylcyclohexene diepoxide** *see* 4-Vinyl-1-cyclohexene Diepoxide  
**vinylcyclohexene dioxide** *see* 4-Vinyl-1-cyclohexene Diepoxide  
**vinyl fluoride** *see* Vinyl Halides (Selected), Vinyl Fluoride  
**vitreous fibers** *see* Certain Glass Wool Fibers (Inhalable)

## W

**WC/Co** *see* Cobalt-Related Exposures, Cobalt-Tungsten Carbide:  
Powders and Hard Metals  
**wine** *see* Alcoholic Beverage Consumption

## X

**xanthotoxin** *see* Methoxsalen with Ultraviolet A Therapy  
**X-radiation** *see* Ionizing Radiation  
**X-rays** *see* Ionizing Radiation, X-Radiation and Gamma Radiation

## Y

**yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-  
trimethoxybenzoyl)oxy]-, methyl ester, (3 $\beta$ ,16 $\beta$ ,17 $\alpha$ ,18 $\beta$ ,20 $\alpha$ )-** *see*  
Reserpine

## Z

**(Z)-1,3-dichloropropene** *see* 1,3-Dichloropropene (Technical Grade)  
**(Z)-2-[4-(1,2-diphenylbut-1-enyl)phenoxy]-*N,N*-  
dimethylethanamine** *see* Tamoxifen  
**Zanosar** *see* Streptozocin  
**zeolites** *see* Erionite  
**zinc beryllium silicate** *see* Beryllium and Beryllium Compounds  
**zinc chromates** *see* Chromium Hexavalent Compounds  
**zinc yellow** *see* Chromium Hexavalent Compounds



## Appendix G: Listed Substances by CAS Number

Appendix G is a list of Chemical Abstracts Service Registry Numbers (CAS numbers) of listed substances for which a CAS number is available. For listings of structurally related chemicals, the list of CAS numbers is not comprehensive for all the chemicals belonging to the class; it generally includes the CAS number of the major chemicals or metals that are highlighted in the profile.

- 50-00-0 *see* Formaldehyde  
 50-18-0 *see* Cyclophosphamide  
 50-28-2 (estradiol-17 $\beta$ ) *see* Estrogens, Steroidal  
 50-29-3 *see* Dichlorodiphenyltrichloroethane  
 50-32-8 (benzo[*a*]pyrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
 50-55-5 *see* Reserpine  
 51-52-5 *see* Propylthiouracil  
 51-79-6 *see* Urethane  
 52-24-4 *see* Thiotepa  
 53-16-7 (estrone) *see* Estrogens, Steroidal  
 53-70-3 (dibenz[*a,h*]anthracene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
 53-96-3 *see* 2-Acetylaminofluorene  
 55-18-5 (*N*-Nitrosodiethylamine) *see* *N*-Nitrosamines: 15 Listings  
 55-86-7 *see* Nitrogen Mustard Hydrochloride  
 55-98-1 *see* 1,4-Butanediol Dimethanesulfonate  
 56-23-5 *see* Carbon Tetrachloride  
 56-53-1 *see* Diethylstilbestrol  
 56-55-3 (benz[*a*]anthracene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
 56-75-7 *see* Chloramphenicol  
 57-14-7 *see* 1,1-Dimethylhydrazine  
 57-41-0 (phenytoin) *see* Phenytoin and Phenytoin Sodium  
 57-57-8 *see*  $\beta$ -Propiolactone  
 57-63-6 (ethinylestradiol) *see* Estrogens, Steroidal  
 57-83-0 *see* Progesterone  
 58-89-9 (lindane) *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers  
 59-89-2 (*N*-nitrosomorpholine) *see* *N*-Nitrosamines: 15 Listings  
 60-11-7 *see* 4-Dimethylaminoazobenzene  
 61-82-5 *see* Amitrole  
 62-44-2 (phenacetin) *see* Phenacetin and Analgesic Mixtures Containing Phenacetin  
 62-50-0 *see* Ethylmethanesulfonate  
 62-55-5 *see* Thioacetamide  
 62-56-6 *see* Thiourea  
 62-75-9 (*N*-nitrosodimethylamine) *see* *N*-Nitrosamines: 15 Listings  
 63-92-3 *see* Phenoxybenzamine Hydrochloride  
 64-67-5 *see* Diethyl Sulfate  
 66-27-3 *see* Methyl Methanesulfonate  
 67-66-3 *see* Chloroform  
 67-72-1 *see* Hexachloroethane  
 68-22-4 *see* Norethisterone  
 70-25-7 (*N*-methyl-*N'*-nitro-*N*-nitrosoguanidine) *see* *N*-Nitrosamines: 15 Listings  
 71-43-2 *see* Benzene  
 71-48-7 (cobalt acetate) *see* Cobalt-Related Exposures  
 72-33-3 (mestranol) *see* Estrogens, Steroidal  
 75-01-4 (vinyl chloride) *see* Vinyl Halides (Selected)  
 75-02-5 (vinyl fluoride) *see* Vinyl Halides (Selected)  
 75-07-0 *see* Acetaldehyde  
 75-09-2 *see* Dichloromethane  
 75-21-8 *see* Ethylene Oxide  
 75-27-4 *see* Bromodichloromethane  
 75-52-5 *see* Nitromethane  
 75-55-8 *see* 2-Methylaziridine  
 75-56-9 *see* Propylene Oxide  
 75-96-7 (tribromoacetic acid) *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)  
 77-09-8 *see* Phenolphthalein  
 77-78-1 *see* Dimethyl Sulfate  
 78-00-2 (tetraethyl lead) *see* Lead and Lead Compounds  
 78-79-5 *see* Isoprene  
 79-01-6 *see* Trichloroethylene  
 79-06-1 *see* Acrylamide  
 79-43-6 (dichloroacetic acid) *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)  
 79-44-7 *see* Dimethylcarbamoyl Chloride  
 79-46-9 *see* 2-Nitropropane  
 81-49-2 *see* 1-Amino-2,4-dibromoanthraquinone  
 82-28-0 *see* 1-Amino-2-methylanthraquinone  
 87-86-5 (pentachlorophenol) *see* Pentachlorophenol and By-products of Its Synthesis  
 88-06-2 *see* 2,4,6-Trichlorophenol  
 88-72-2 *see* *o*-Nitrotoluene  
 90-04-0 (*o*-anisidine) *see* *o*-Anisidine and Its Hydrochloride  
 90-94-8 *see* Michler's Ketone  
 91-08-7 (2,6-toluene diisocyanate) *see* Toluene Diisocyanates  
 91-20-3 *see* Naphthalene  
 91-23-6 *see* *o*-Nitroanisole  
 91-59-8 *see* 2-Naphthylamine  
 91-94-1 (3,3'-dichlorobenzidine) *see* 3,3'-Dichlorobenzidine and Its Dihydrochloride  
 92-67-1 *see* 4-Aminobiphenyl  
 92-87-5 (benzidine) *see* Benzidine and Dyes Metabolized to Benzidine  
 93-15-2 *see* Methyleugenol  
 94-59-7 *see* Saffrole  
 95-06-7 *see* Sulfalate  
 95-53-4 (*o*-toluidine) *see* *o*-Toluidine and Its Hydrochloride  
 95-69-2 (*p*-chloro-*o*-toluidine) *see* *p*-Chloro-*o*-toluidine and Its Hydrochloride  
 95-80-7 *see* 2,4-Diaminotoluene  
 95-83-0 *see* 4-Chloro-*o*-phenylenediamine  
 96-09-3 *see* Styrene-7,8-oxide  
 96-12-8 *see* 1,2-Dibromo-3-chloropropane  
 96-13-9 *see* 2,3-Dibromo-1-propanol  
 96-18-4 *see* 1,2,3-Trichloropropane  
 96-45-7 *see* Ethylene Thiourea  
 97-56-3 *see* *o*-Aminoazotoluene  
 98-07-7 *see* Benzotrichloride  
 98-82-8 *see* Cumene  
 98-95-3 *see* Nitrobenzene  
 100-42-5 *see* Styrene  
 100-75-4 (*N*-nitrosopiperidine) *see* *N*-Nitrosamines: 15 Listings  
 101-14-4 *see* 4,4'-Methylenebis(2-chloroaniline)  
 101-61-1 *see* 4,4'-Methylenebis(*N,N*-dimethyl)benzeneamine  
 101-77-9 (4,4'-methylenedianiline) *see* 4,4'-Methylenedianiline and its Dihydrochloride  
 101-80-4 *see* 4,4'-Oxydianiline  
 101-90-6 *see* Diglycidyl Resorcinol Ether  
 106-46-7 *see* 1,4-Dichlorobenzene  
 106-87-6 *see* 4-Vinyl-1-cyclohexene Diepoxide  
 106-89-8 *see* Epichlorohydrin  
 106-93-4 *see* 1,2-Dibromoethane  
 106-94-5 *see* 1-Bromopropane  
 106-99-0 *see* 1,3-Butadiene  
 107-06-2 *see* 1,2-Dichloroethane  
 107-13-1 *see* Acrylonitrile  
 107-30-2 (chloromethyl methyl ether) *see* Bis(chloromethyl) Ether and Technical-Grade Chloromethyl Methyl Ether  
 110-00-9 *see* Furan  
 115-28-6 *see* Chlorendic Acid  
 116-14-3 *see* Tetrafluoroethylene  
 117-10-2 *see* Danthron  
 117-79-3 *see* 2-Aminoanthraquinone  
 117-81-7 *see* Di(2-ethylhexyl) Phthalate  
 118-74-1 *see* Hexachlorobenzene  
 119-90-4 (3,3'-dimethoxybenzidine) *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine  
 119-93-7 (3,3'-dimethylbenzidine) *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine  
 120-71-8 *see* *p*-Cresidine  
 122-66-7 *see* Hydrazobenzene

## Report on Carcinogens, Fifteenth Edition

- 123-91-1 *see* 1,4-Dioxane  
126-72-7 *see* Tris(2,3-dibromopropyl) Phosphate  
126-99-8 *see* Chloroprene  
127-18-4 *see* Tetrachloroethylene  
131-52-2 (pentachlorophenol, sodium salt) *see* Pentachlorophenol and By-products of Its Synthesis  
134-29-2 (*o*-anisidine hydrochloride) *see* *o*-Anisidine and Its Hydrochloride  
135-20-6 *see* Cupferron  
136-35-6 *see* Diazoaminobenzene  
136-40-3 *see* Phenazopyridine Hydrochloride  
139-13-9 *see* Nitrotriacetic Acid  
139-65-1 *see* 4,4'-Thiodianiline  
143-50-0 *see* Kepone  
148-82-3 *see* Melphalan  
154-93-8 bis(chloroethyl) nitrosourea *see* Nitrosourea Chemotherapeutic Agents  
189-55-9 (dibenzo[*a,i*]pyrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
189-64-0 (dibenzo[*a,h*]pyrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
191-30-0 (dibenzo[*a,l*]pyrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
192-65-4 (dibenzo[*a,e*]pyrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
193-39-5 (indeno[1,2,3-*cd*]pyrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
194-59-2 (7H-dibenzo[*c,g*]carbazole) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
205-82-3 (benzo[*j*]fluoranthrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
205-99-2 (benzo[*b*]fluoranthrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
207-08-9 (benzo[*k*]fluoranthrene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
224-42-0 (dibenz[*a,j*]acridine) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
226-36-8 (dibenz[*a,h*]acridine) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
298-81-7 (methoxsalen) *see* Methoxsalen with Ultraviolet A Therapy  
302-01-2 (hydrazine) *see* Hydrazine and Hydrazine Sulfate  
303-47-9 *see* Ochratoxin A  
305-03-3 *see* Chlorambucil  
313-67-7 (aristolochic acid I) *see* Aristolochic Acids  
319-84-6 ( $\alpha$ -hexachlorocyclohexane) *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers  
319-85-7 ( $\beta$ -hexachlorocyclohexane) *see* Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers  
320-67-2 *see* Azacitidine  
366-70-1 (procarbazine hydrochloride) *see* Procarbazine and Its Hydrochloride  
373-02-4 (nickel acetate) *see* Nickel and Nickel Compounds  
434-07-1 *see* Oxymetholone  
443-48-1 *see* Metronidazole  
446-86-6 *see* Azathioprine  
475-80-9 (aristolochic acid II) *see* Aristolochic Acids  
505-60-2 *see* Mustard Gas  
509-14-8 *see* Tetranitromethane  
513-37-1 *see* Dimethylvinyl Chloride  
542-75-6 (1,3-dichloropropene) *see* 1,3-Dichloropropene (Technical Grade)  
542-88-1 (bis(chloromethyl) ether) *see* Bis(chloromethyl) Ether and Technical-Grade Chloromethyl Methyl Ether  
556-52-5 *see* Glycidol  
563-47-3 *see* 3-Chloro-2-methylpropene  
569-61-9 *see* Basic Red 9 Monohydrate  
584-84-9 (2,4-toluene diisocyanate) *see* Toluene Diisocyanates  
593-60-2 (vinyl bromide) *see* Vinyl Halides (Selected)  
612-82-8 (3,3'-dimethylbenzidine dihydrochloride) *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine  
612-83-9 (3,3'-dichlorobenzidine dihydrochloride) *see* 3,3'-Dichlorobenzidine and Its Dihydrochloride  
621-64-7 (*N*-nitrosodi-*n*-propylamine) *see* *N*-Nitrosamines: 15 Listings  
630-93-3 (phenytoin sodium) *see* Phenytoin and Phenytoin Sodium  
631-64-1 (dibromoacetic acid) *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)  
671-16-9 (procarbazine) *see* Procarbazine and Its Hydrochloride  
680-31-9 *see* Hexamethylphosphoramide  
684-93-5 (*N*-nitroso-*N*-methylurea) *see* *N*-Nitrosamines: 15 Listings  
759-73-9 (*N*-nitroso-*N*-ethylurea) *see* *N*-Nitrosamines: 15 Listings  
924-16-3 (*N*-nitrosodi-*n*-butylamine) *see* *N*-Nitrosamines: 15 Listings  
930-55-2 (*N*-nitrosopyrrolidine) *see* *N*-Nitrosamines: 15 Listings  
1116-54-7 (*N*-nitrosodiethanolamine) *see* *N*-Nitrosamines: 15 Listings  
1120-71-4 *see* 1,3-Propane Sultone  
1304-56-9 (beryllium oxide) *see* Beryllium and Beryllium Compounds  
1307-96-6 (cobalt oxide) *see* Cobalt-Related Exposures  
1309-64-4 *see* Antimony Trioxide  
1313-99-1 (nickel monoxide) *see* Nickel and Nickel Compounds  
1314-20-1 (thorium dioxide) *see* Ionizing Radiation  
1327-53-3 (arsenic trioxide) *see* Arsenic and Inorganic Arsenic Compounds  
1332-21-4 *see* Asbestos  
1333-82-0 (chromium trioxide) *see* Chromium Hexavalent Compounds  
1335-32-6 (lead subacetate) *see* Lead and Lead Compounds  
1336-36-3 *see* Polychlorinated Biphenyls  
1402-68-2 *see* Aflatoxins  
1464-53-5 *see* Diepoxybutane  
1746-01-6 *see* 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin  
1836-75-5 *see* Nitrofen  
1937-37-7 (C.I. direct black 38) *see* Benzidine and Dyes Metabolized to Benzidine  
2385-85-5 *see* Mirex  
2425-06-1 *see* Captafol  
2429-74-5 (C.I. direct blue 15) *see* 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine  
2475-45-8 *see* Disperse Blue 1  
2602-46-2 (C.I. direct blue 6) *see* Benzidine and Dyes Metabolized to Benzidine  
3165-93-3 (*p*-chloro-*o*-toluidine hydrochloride) *see* *p*-Chloro-*o*-toluidine and Its Hydrochloride  
3296-90-0 (2,2-bis(bromomethyl)-1,3-propanediol) *see* 2,2-Bis(bromomethyl)-1,3-propanediol (Technical Grade)  
3697-24-3 (5-methylchrysene) *see* Polycyclic Aromatic Hydrocarbons: 15 Listings  
4342-03-4 *see* Dacarbazine  
4549-40-0 (*N*-nitrosomethylvinylamine) *see* *N*-Nitrosamines: 15 Listings  
5278-95-5 (chlorodibromoacetic acid) *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)  
5522-43-0 (1-nitropyrene) *see* Nitroarenes (Selected)  
5589-96-8 (bromochloroacetic acid) *see* Haloacetic Acids Found as Water Disinfection By-products (Selected)  
6459-94-5 (C.I. acid red 114) *see* 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine  
7439-92-1 (lead) *see* Lead and Lead Compounds  
7440-02-0 (nickel) *see* Nickel Compounds and Metallic Nickel  
7440-38-2 (arsenic) *see* Arsenic and Inorganic Arsenic Compounds  
7440-41-7 (beryllium) *see* Beryllium and Beryllium Compounds  
7440-43-9 (cadmium) *see* Cadmium and Cadmium Compounds  
7440-48-4 (cobalt) *see* Cobalt-Related Exposures  
7446-27-7 (lead phosphate) *see* Lead and Lead Compounds  
7446-34-6 *see* Selenium Sulfide  
7496-02-8 (6-nitrochrysene) *see* Nitroarenes (Selected)  
7631-89-2 (sodium arsenate) *see* Arsenic and Inorganic Arsenic Compounds  
7646-79-9 (cobalt chloride) *see* Cobalt-Related Exposures  
7631-89-2 (sodium arsenate) *see* Arsenic and Inorganic Arsenic Compounds  
7646-79-9 (cobalt chloride) *see* Cobalt-Related Exposures  
7664-93-9 (sulfuric acid) *see* Strong Inorganic Acid Mists Containing Sulfuric Acid  
7775-11-3 (sodium chromate) *see* Chromium Hexavalent Compounds  
7778-44-1 (calcium arsenate) *see* Arsenic and Inorganic Arsenic Compounds  
7778-50-9 (potassium dichromate) *see* Chromium Hexavalent Compounds  
7784-40-9 (lead arsenate) *see* Arsenic and Inorganic Arsenic Compounds  
7784-46-5 (sodium arsenite) *see* Arsenic and Inorganic Arsenic Compounds  
7786-81-4 (nickel sulfate) *see* Nickel and Nickel Compounds  
7787-47-5 (beryllium chloride) *see* Beryllium and Beryllium Compounds  
7787-56-6 (beryllium sulfate tetrahydrate) *see* Beryllium and Beryllium Compounds  
7788-98-9 (ammonium chromate) *see* Chromium Hexavalent Compounds  
7789-00-6 (potassium chromate) *see* Chromium Hexavalent Compounds  
7789-06-2 (strontium chromate) *see* Chromium Hexavalent Compounds  
7789-09-5 (ammonium dichromate) *see* Chromium Hexavalent Compounds  
8001-35-2 *see* Toxaphene  
8007-45-2 (coal tar) *see* Coal Tars and Coal-Tar Pitches  
9004-66-4 *see* Iron Dextran Complex  
10026-24-1 (cobalt sulfate heptahydrate) *see* Cobalt-Related Exposures  
10034-93-2 (hydrazine sulfate) *see* Hydrazine and Hydrazine Sulfate  
10043-92-2 (radon) *see* Ionizing Radiation  
10108-64-2 (cadmium chloride) *see* Cadmium and Cadmium Compounds



## Report on Carcinogens, Fifteenth Edition

- 10124-43-3 (cobalt sulfate) *see* Cobalt-Related Exposures  
10141-05-6 (cobalt nitrate) *see* Cobalt-Related Exposures  
10540-29-1 *see* Tamoxifen  
10588-01-9 (sodium dichromate) *see* Chromium Hexavalent Compounds  
11104-61-3 (cobalt oxide) *see* Cobalt-Related Exposures  
11113-75-0 (nickel sulfide) *see* Nickel and Nickel Compounds  
11119-70-3 (lead chromate) *see* Chromium Hexavalent Compounds  
12001-28-4 (crocidolite) *see* Asbestos  
12001-29-5 (chrysotile) *see* Asbestos  
12035-72-2 (nickel subsulfide) *see* Nickel and Nickel Compounds  
12054-48-7 (nickel hydroxide) *see* Nickel and Nickel Compounds  
12126-59-9 (conjugated estrogens) *see* Estrogens, Steroidal  
12172-73-5 (amosite) *see* Asbestos  
12653-56-4 (cobalt sulfide) *see* Cobalt-Related Exposures  
13010-47-4 (1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea) *see* Nitrosourea  
Chemotherapeutic Agents  
13256-22-9 (*N*-nitrososarcosine) *see* *N*-Nitrosamines: 15 Listings  
13327-32-7 (beryllium hydroxide) *see* Beryllium and Beryllium Compounds  
13464-35-2 (potassium arsenite) *see* Arsenic and Inorganic Arsenic Compounds  
13510-49-1 (beryllium sulfate) *see* Beryllium and Beryllium Compounds  
13530-65-9 (zinc chromate) *see* Chromium Hexavalent Compounds  
13552-44-8 (4,4'-methylenedianiline dihydrochloride) *see* 4,4'-Methylenedianiline and its  
Dihydrochloride  
13598-00-0 (beryllium silicate) *see* Beryllium and Beryllium Compounds  
13598-15-7 (beryllium phosphate) *see* Beryllium and Beryllium Compounds  
13654-09-6 (decabromobiphenyl) *see* Polybrominated Biphenyls  
13765-19-0 (calcium chromate) *see* Chromium Hexavalent Compounds  
13909-09-6 (1-(2-chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea) *see* Nitrosourea  
Chemotherapeutic Agents  
14464-46-1 (cristobalite) *see* Silica  
14808-60-7 (quartz) *see* Silica  
15347-57-6 (lead acetate) *see* Lead and Lead Compounds  
15468-32-3 (tridymite) *see* Silica  
15663-27-1 *see* Cisplatin  
16071-86-6 (C.I. direct brown 95) *see* Benzidine and Dyes Metabolized to Benzidine  
16543-55-8 (*N*-nitrosornicotine) *see* *N*-Nitrosamines: 15 Listings  
18540-29-9 (chromium VI) *see* Chromium Hexavalent Compounds  
18883-66-4 (streptozotocin) *see* Nitrosourea Chemotherapeutic Agents  
23214-92-8 *see* Adriamycin  
23246-96-0 *see* Riddelliine  
25013-16-5 *see* Butylated Hydroxyanisole  
25316-40-9 (doxorubicin hydrochloride) *see* Adriamycin  
25638-88-4 (zinc beryllium silicate) *see* Beryllium and Beryllium Compounds  
26471-62-5 *see* Toluene Diisocyanates  
36355-01-8 (hexabromobiphenyl) *see* Polybrominated Biphenyls  
39156-41-7 *see* 2,4-Diaminoanisole Sulfate  
42397-64-8 (1,6-dinitropyrene) *see* Nitroarenes (Selected)  
42397-65-9 (1,8-dinitropyrene) *see* Nitroarenes (Selected)  
54749-90-5 (chlorozotocin) *see* Nitrosourea Chemotherapeutic Agents  
57835-92-4 (4-nitropyrene) *see* Nitroarenes (Selected)  
59865-13-3 *see* Cyclosporin A  
61288-13-9 (octabromobiphenyl) *see* Polybrominated Biphenyls  
64091-91-4 (4-(*N*-nitrosomethylamino)-1-(3-pyridyl)-1-butanone) *see* *N*-Nitrosamine  
Compounds: 15 Listings  
65996-93-2 (coal-tar pitch) *see* Coal Tar and Coal-Tar Pitches  
66104-24-3 (beryllium carbonate) *see* Beryllium and Beryllium Compounds  
66733-21-9 *see* Erionite  
71133-14-7 (bromodichloroacetic acid) *see* Haloacetic Acids Found as Water Disinfection By-  
products (Selected)  
76180-96-6 (2-amino-3-methylimidazo-[4,5-*f*]quinoline [IQ]) *see* Heterocyclic Amines  
(Selected)  
77094-11-2 (2-amino-3,4-dimethylimidazo[4,5-*f*]quinoline [MeIQ]) *see* Heterocyclic Amines  
(Selected)  
77500-04-0 (2-amino-3,8-dimethylimidazo[4,5-*f*]quinoxaline [MeIQx]) *see* Heterocyclic Amines  
(Selected)  
77536-66-4 (actinolite) *see* Asbestos  
77536-67-5 (anthophyllite) *see* Asbestos  
77536-68-6 (tremolite) *see* Asbestos  
105650-23-5 (2-amino-1-methyl-6-phenylimidazo[4,5-*b*]pyridine [PhIP]) *see* Heterocyclic  
Amines (Selected)  
108171-26-2 *see* Chlorinated Paraffins (C<sub>12</sub>, 60% Chlorine)



U.S. Department of Health and Human Services  
Public Health Service  
National Toxicology Program  
PO Box 12233  
Research Triangle Park, NC 27709-2510  
SSN 1551-8280