

## Substances Listed in the Fifteenth Report on Carcinogens

**Bold entries** indicate new or changed listings in the Fifteenth Report on Carcinogens.

### Known To Be Human Carcinogens

Aflatoxins

Alcoholic Beverage Consumption

4-Aminobiphenyl

Analgesic Mixtures Containing Phenacetin (see Phenacetin and Analgesic Mixtures Containing Phenacetin)

Aristolochic Acids

Arsenic and Inorganic Arsenic Compounds

Asbestos

Azathioprine

Benzene

Benzidine (see Benzidine and Dyes Metabolized to Benzidine)

Beryllium and Beryllium Compounds

Bis(chloromethyl) Ether and Technical-Grade Chloromethyl Methyl Ether

1,3-Butadiene

1,4-Butanediol Dimethanesulfonate

Cadmium and Cadmium Compounds

Chlorambucil

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

Chromium Hexavalent Compounds

Coal Tars and Coal-Tar Pitches

Coke-Oven Emissions

Cyclophosphamide

Cyclosporin A

Diethylstilbestrol

Dyes Metabolized to Benzidine (Benzidine Dye Class) (see Benzidine and Dyes Metabolized to Benzidine)

Epstein-Barr Virus (see Viruses: Eight Listings)

Erionite

Estrogens, Steroidal

Ethylene Oxide

Formaldehyde

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

Hepatitis B Virus (see Viruses: Eight Listings)

Hepatitis C Virus (see Viruses: Eight Listings)

Human Immunodeficiency Virus Type 1 (see Viruses: Eight Listings)

Human Papillomaviruses: Some Genital-Mucosal Types (see Viruses: Eight Listings)

Human T-Cell Lymphotropic Virus Type 1 (see Viruses: Eight Listings)

Kaposi Sarcoma–Associated Herpesvirus (see Viruses: Eight Listings)

Melphalan

Merkel Cell Polyomavirus (see Viruses: Eight Listings)

Methoxsalen with Ultraviolet A Therapy

Mineral Oils: Untreated and Mildly Treated

Mustard Gas

2-Naphthylamine

Neutrons (see Ionizing Radiation)

Nickel Compounds (see Nickel Compounds and Metallic Nickel)

Radon (see Ionizing Radiation)

Silica, Crystalline (Respirable Size)

Solar Radiation (see Ultraviolet Radiation Related Exposures)

Soots

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Strong Inorganic Acid Mists Containing Sulfuric Acid  
Sunlamps or Sunbeds, Exposure to (see Ultraviolet Radiation Related Exposures)  
Tamoxifen  
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin  
Thiotepa  
Thorium Dioxide (see Ionizing Radiation)  
Tobacco Smoke, Environmental (see Tobacco-Related Exposures)  
Tobacco Smoking (see Tobacco-Related Exposures)  
Tobacco, Smokeless (see Tobacco-Related Exposures)  
*o*-Toluidine  
Trichloroethylene  
Ultraviolet Radiation, Broad-Spectrum (see Ultraviolet Radiation Related Exposures)  
Vinyl Chloride (see Vinyl Halides [selected])  
Wood Dust  
X-Radiation and Gamma Radiation (see Ionizing Radiation)

### **Reasonably Anticipated To Be Human Carcinogens**

Acetaldehyde  
2-Acetylaminofluorene  
Acrylamide  
Acrylonitrile  
Adriamycin  
2-Aminoanthraquinone  
*o*-Aminoazotoluene  
1-Amino-2,4-dibromoanthraquinone  
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])  
1-Amino-2-methylanthraquinone  
2-Amino-3-methylimidazo[4,5-*f*]quinoline (see Heterocyclic Amines [Selected])  
2-Amino-1-methyl-6-phenylimidazo[4,5-*b*]pyridine (see Heterocyclic Amines [Selected])  
Amitrole  
*o*-Anisidine and Its Hydrochloride

### **Antimony Trioxide**

Azacitidine  
Basic Red 9 Monohydrochloride  
Benz[*a*]anthracene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)  
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)  
Benzo[*a*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)  
Benzotrichloride  
2,2-Bis(bromomethyl)-1,3-propanediol (Technical Grade)  
Bis(chloroethyl) Nitrosourea (see Nitrosourea Chemotherapeutic Agents)  
**Bromochloroacetic Acid** (see Haloacetic Acids Found as Water Disinfection By-Products [Selected])  
**Bromodichloroacetic Acid** (see Haloacetic Acids Found as Water Disinfection By-Products [Selected])  
Bromodichloromethane  
1-Bromopropane  
Butylated Hydroxyanisole  
Captafol  
Carbon Tetrachloride  
Ceramic Fibers (Respirable Size)  
Chloramphenicol  
Chlorendic Acid

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Chlorinated Paraffins (C<sub>12</sub>, 60% Chlorine)

**Chlorodibromoacetic Acid** (see Haloacetic Acids Found as Water Disinfection By-Products [Selected])

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

Chloroform

3-Chloro-2-methylpropene

4-Chloro-*o*-phenylenediamine

Chloroprene

*p*-Chloro-*o*-toluidine and Its Hydrochloride

Chlorozotocin (see Nitrosourea Chemotherapeutic Agents)

Cisplatin

Cobalt and Cobalt Compounds That Release Cobalt Ions *In Vivo* (see Cobalt-Related Exposures)

Cobalt-Tungsten Carbide: Powders and Hard Metals (see Cobalt-Related Exposures)

*p*-Cresidine

Cumene

Cupferron

Dacarbazine

Danthron

2,4-Diaminoanisole Sulfate

2,4-Diaminotoluene

Diazoaminobenzene

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-Dibenzo[*c,g*]carbazole (see Polycyclic Aromatic Hydrocarbons: 15 Listings)

Dibenzo[*a,e*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)

Dibenzo[*a,h*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)

Dibenzo[*a,l*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)

Dibenzo[*a,i*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)

**Dibromoacetic Acid** (see Haloacetic Acids Found as Water Disinfection By-Products [Selected])

1,2-Dibromo-3-chloropropane

1,2-Dibromoethane

2,3-Dibromo-1-propanol

**Dichloroacetic Acid** (see Haloacetic Acids Found as Water Disinfection By-Products [Selected])

1,4-Dichlorobenzene

3,3'-Dichlorobenzidine and Its Dihydrochloride

Dichlorodiphenyltrichloroethane

1,2-Dichloroethane

Dichloromethane

1,3-Dichloropropene (Technical Grade)

Diepoxybutane

Diesel Exhaust Particulates

Di(2-ethylhexyl) Phthalate

Diethyl Sulfate

Diglycidyl Resorcinol Ether

3,3'-Dimethoxybenzidine (see 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine)

4-Dimethylaminoazobenzene

3,3'-Dimethylbenzidine (see 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine)

Dimethylcarbamoyl Chloride

1,1-Dimethylhydrazine

Dimethyl Sulfate

Dimethylvinyl Chloride

1,6-Dinitropyrene (see Nitroarenes [Selected])

1,8-Dinitropyrene (see Nitroarenes [Selected])

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1,4-Dioxane  
Disperse Blue 1  
Dyes Metabolized to 3,3'-Dimethoxybenzidine (3,3'-Dimethoxybenzidine Dye Class)  
(see 3,3'-Dimethoxybenzidine and Dyes Metabolized to 3,3'-Dimethoxybenzidine)  
Dyes Metabolized to 3,3'-Dimethylbenzidine (3,3'-Dimethylbenzidine Dye Class)  
(see 3,3'-Dimethylbenzidine and Dyes Metabolized to 3,3'-Dimethylbenzidine)  
Epichlorohydrin  
Ethylene Thiourea  
Ethyl Methanesulfonate  
Furan  
Glass Wool Fibers (Inhalable), Certain  
Glycidol  
Hexachlorobenzene  
Hexachloroethane  
Hexamethylphosphoramide  
Hydrazine and Hydrazine Sulfate  
Hydrazobenzene  
Indeno[1,2,3-*cd*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)  
Iron Dextran Complex  
Isoprene  
Kepone  
Lead and Lead Compounds  
Lindane, Hexachlorocyclohexane (Technical Grade), and Other Hexachlorocyclohexane Isomers  
2-Methylaziridine  
5-Methylchrysene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)  
4,4'-Methylenebis(2-chloroaniline)  
4,4'-Methylenebis(*N,N*-dimethyl)benzenamine  
4,4'-Methylenedianiline and Its Dihydrochloride  
Methyleugenol  
Methyl Methanesulfonate  
*N*-Methyl-*N'*-Nitro-*N*-Nitrosoguanidine (see *N*-Nitrosamines: 15 Listings)  
Metronidazole  
Michler's Ketone  
Mirex  
Naphthalene  
Nickel, Metallic (see Nickel Compounds and Metallic Nickel)  
Nitrilotriacetic Acid  
*o*-Nitroanisole  
Nitrobenzene  
6-Nitrochrysene (see Nitroarenes [Selected])  
Nitrofen  
Nitrogen Mustard Hydrochloride  
Nitromethane  
2-Nitropropane  
1-Nitropyrene (see Nitroarenes [Selected])  
4-Nitropyrene (see Nitroarenes [Selected])  
*N*-Nitrosodi-*n*-butylamine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosodiethanolamine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosodiethylamine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosodimethylamine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosodi-*n*-propylamine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitroso-*N*-ethylurea (see *N*-Nitrosamines: 15 Listings)  
4-(*N*-Nitrosomethylamino)-1-(3-pyridyl)-1-butanone (see *N*-Nitrosamines: 15 Listings)

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*N*-Nitroso-*N*-methylurea (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosomethylvinylamine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosomorpholine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosornicotine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosopiperidine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrosopyrrolidine (see *N*-Nitrosamines: 15 Listings)  
*N*-Nitrososarcosine (see *N*-Nitrosamines: 15 Listings)  
*o*-Nitrotoluene  
Norethisterone  
Ochratoxin A  
4,4'-Oxydianiline  
Oxymetholone  
Pentachlorophenol and By-products of Its Synthesis  
Phenacetin (see Phenacetin and Analgesic Mixtures Containing Phenacetin)  
Phenazopyridine Hydrochloride  
Phenolphthalein  
Phenoxybenzamine Hydrochloride  
Phenytoin and Phenytoin Sodium  
Polybrominated Biphenyls  
Polychlorinated Biphenyls  
Procarbazine and Its Hydrochloride  
Progesterone  
1,3-Propane Sultone  
 $\beta$ -Propiolactone  
Propylene Oxide  
Propylthiouracil  
Reserpine  
Riddelliine  
Safrole  
Selenium Sulfide  
Streptozotocin (see Nitrosourea Chemotherapeutic Agents)  
Styrene  
Styrene-7,8-oxide  
Sulfallate  
Tetrachloroethylene  
Tetrafluoroethylene  
Tetranitromethane  
Thioacetamide  
4,4'-Thiodianiline  
Thiourea  
Toluene Diisocyanates  
Toxaphene  
**Tribromoacetic Acid** (see Haloacetic Acids Found as Water Disinfection By-Products [Selected])  
2,4,6-Trichlorophenol  
1,2,3-Trichloropropane  
Tris(2,3-dibromopropyl) Phosphate  
Ultraviolet Radiation A (see Ultraviolet Radiation Related Exposures)  
Ultraviolet Radiation B (see Ultraviolet Radiation Related Exposures)  
Ultraviolet Radiation C (see Ultraviolet Radiation Related Exposures)  
Urethane  
Vinyl Bromide (see Vinyl Halides [Selected])  
4-Vinyl-1-cyclohexene Diepoxide  
Vinyl Fluoride (see Vinyl Halides [Selected])