

## Substances Listed in the Thirteenth Report on Carcinogens

**Bold entries** indicate new or changed listings in the Thirteenth 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)  
Erionite  
Estrogens, Steroidal  
Ethylene Oxide  
Formaldehyde  
Hepatitis B Virus  
Hepatitis C Virus  
Human Papillomaviruses: Some Genital-Mucosal Types  
Melphalan  
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  
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**

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

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)

Bromodichloromethane

**1-Bromopropane**

Butylated Hydroxyanisole

Captafol

Carbon Tetrachloride

Ceramic Fibers (Respirable Size)

Chloramphenicol

Chlorendic Acid

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

Chloroform

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

3-Chloro-2-methylpropene

4-Chloro-*o*-phenylenediamine

Chloroprene

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

Chlorozotocin (see Nitrosourea Chemotherapeutic Agents)

Cisplatin

Cobalt Sulfate

Cobalt–Tungsten Carbide: Powders and Hard Metals  
*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,i*]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,i*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)  
Dibenzo[*a,l*]pyrene (see Polycyclic Aromatic Hydrocarbons: 15 Listings)  
1,2-Dibromo-3-chloropropane  
1,2-Dibromoethane  
2,3-Dibromo-1-propanol  
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])  
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)  
*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  
Trichloroethylene  
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])