

# *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*

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## **Monographs**

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ISBN 92 832 1216 9

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ISBN 92 832 1525 7

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**Volume 32****[Polynuclear Aromatic Compounds, Part 1: Chemical, Environmental and Experimental Data](#)**

1983; 477 pages

ISBN 92 832 1532 X (out of print)

**Volume 33****[Polynuclear Aromatic Compounds, Part 2: Carbon Blacks, Mineral Oils \(Lubricant Base Oils and Derived Products\) and Some Nitroarenes](#)**

1984; 245 pages

ISBN 92 832 1533 8 (out of print)

**Volume 34****[Polynuclear Aromatic Compounds, Part 3: Industrial Exposures in Aluminium Production, Coal Gasification, Coke Production, and Iron and Steel Founding](#)**

1984; 219 pages

ISBN 92 832 1534 6 (out of print)

**Volume 35****[Polynuclear Aromatic Compounds, Part 4: Bitumens, Coal-Tars and Derived Products, Shale-Oils and Soots](#)**

1985; 271 pages  
ISBN 92 832 1535 4

**Volume 36**

**[Allyl Compounds, Aldehydes, Epoxides and Peroxides](#)**

1985; 369 pages  
ISBN 92 832 1536 2

**Volume 37**

**[Tobacco Habits Other than Smoking; Betel-Quid and Areca-Nut Chewing; and Some Related Nitrosamines](#)**

1985; 291 pages  
ISBN 92 832 1537 0 (out of print)

**Volume 38**

**[Tobacco Smoking](#)**

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ISBN 92 832 1538 9

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**[Some Chemicals Used in Plastics and Elastomers](#)**

1986; 403 pages  
ISBN 92 832 1239 8 (out of print)

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ISBN 92 832 1240 1 (out of print)

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ISBN 92 832 1242 8

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1988; 300 pages  
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1988; 416 pages  
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**Occupational Exposures in Petroleum Refining; Crude Oil and Major Petroleum Fuels**

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and Exposures in the Textile Manufacturing Industry**

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**Chromium, Nickel and Welding**

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ISBN: 92 832 1249 5

**Volume 50**

**Some Pharmaceutical Drugs**

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ISBN: 92 832 1250 9

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**Coffee, Tea, Mate, Methylxanthines and Methylglyoxal**

1991; 513 pages  
ISBN: 92 832 1251 7

**Volume 52**

**Chlorinated Drinking-water; Chlorination By-products; Some Other Halogenated Compounds;  
Cobalt and Cobalt Compounds**

1991; 544 pages  
ISBN: 92 832 1252 5

**Volume 53****Occupational Exposures in Insecticide Application, and Some Pesticides**

1991; 612 pages  
ISBN 92 832 1253 3

**Volume 54****Occupational Exposures to Mists and Vapours from Strong Inorganic Acids; and Other Industrial Chemicals**

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**Volume 56****Some Naturally Occurring Substances: Food Items and Constituents, Heterocyclic Aromatic Amines and Mycotoxins**

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ISBN 92 832 1256 8

**Volume 57****Occupational Exposures of Hairdressers and Barbers and Personal Use of Hair Colourants; Some Hair Dyes, Cosmetic Colourants, Industrial Dyestuffs and Aromatic Amines**

1993; 427 pages  
ISBN 92 832 1257 6

**Volume 58****Beryllium, Cadmium, Mercury, and Exposures in the Glass Manufacturing Industry**

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ISBN 92 832 1258 4

**Volume 59****Hepatitis Viruses**

1994; 286 pages  
ISBN 92 832 1259 2

**Volume 60****Some Industrial Chemicals**

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ISBN 92 832 1260 6

**Volume 61****Schistosomes, Liver Flukes and *Helicobacter pylori***

1994; 280 pages  
ISBN 92 832 1261 4

**Volume 62**

**Wood dust and Formaldehyde**

1995; 405 pages  
ISBN 92 832 1262 2

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**Dry cleaning, Some Chlorinated Solvents and Other Industrial Chemicals**

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**Human Papillomaviruses**

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ISBN 92 832 1264 9

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ISBN 92 832 1266 5

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**Polychlorinated Dibenzo-*para*-Dioxins and Polychlorinated Dibenzofurans**

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ISBN 92 832 1269 X

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**Epstein-Barr Virus and Kaposi's Sarcoma Herpesvirus/Human Herpesvirus 8**

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ISBN 92 832 1270 3

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ISBN 92 832 1271 1

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ISBN 92 832 1272 X

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ISBN 92 832 1274 6

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2000; 492 pages  
ISBN 92 832 1275 4

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2000; 522 pages  
ISBN 92 832 1276 2

**Volume 77****[Some Industrial Chemicals](#)**

2000; 564 pages  
ISBN 92 832 1277 0

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2001; 596 pages  
ISBN 92 832 1278 9

**Volume 79****[Some Thyrotropic Agents](#)**

2001; 763 pages  
ISBN 92 832 1279 7

**Volume 80**

**[Non-Ionizing Radiation, Part 1: Static and Extremely Low-Frequency \(ELF\) Electric and Magnetic Fields](#)**

2002; 429 pages  
ISBN 92 832 1280 0

**Volume 81**

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2002; 418 pages  
ISBN 92 832 1281 9

**Volume 82**

**[Some Traditional Herbal Medicines, Some Mycotoxins, Naphthalene and Styrene](#)**

2002; 590 pages  
ISBN 92 832 1282 7

**Volume 83**

**[Tobacco Smoke and Involuntary Smoking](#)**

2004; 1452 pages  
ISBN 92 832 1283 5

**Volume 84**

**[Some Drinking-water Disinfectants and Contaminants, including Arsenic](#)**

2004; 512 pages  
ISBN 92 832 1284 3

**Volume 85**

**[Betel-quid and Areca-nut Chewing and Some Areca-nut-derived Nitrosamines](#)**

2004;; 334 pages  
ISBN 92 832 1285 1

**Volume 86 (in preparation)**

**Cobalt in Hard-metals and Cobalt Sulfate, Gallium Arsenide, Indium Phosphide and Vanadium Pentoxide**

**Volume 87 (in preparation)**

**Inorganic and Organic Lead Compounds**

**Volume 88 (in preparation)**

**[Formaldehyde, 2-Butoxyethanol and 1-tert-Butoxy-2-propanol](#)**

***Supplements to the Monographs***

**Supplement No. 1**

**Chemicals and Industrial Processes Associated with Cancer in Humans (IARC Monographs, Volumes 1 to 20)**

1979; 71 pages  
ISBN 92 832 1404 8 (out of print)

**Supplement No. 2****Long-Term and Short-Term Screening Assays for Carcinogens: A Critical Appraisal**

1980; 426 pages

ISBN 92 832 1404 8 (out of print)

Replaced by IARC Scientific Publication No. 83

**Supplement No. 3****Cross Index of Synonyms and Trade Names in Volumes 1 to 26**

1982; 199 pages

ISBN 92 832 1405 6 (out of print)

**Supplement No. 4****Chemicals, Industrial Processes and Industries Associated with Cancer in Humans (IARC Monographs, Volumes 1 to 29)**

1982; 292 pages

ISBN 92 832 1407 2 (out of print)

**Supplement No. 5****Cross Index of Synonyms and Trade Names in Volumes 1 to 36**

1985; 259 pages

ISBN 92 832 1408 0 (out of print)

**Supplement No. 6****Genetic and Related Effects: An Updating of Selected IARC Monographs from Volumes 1 to 42**

1987; 729 pages

ISBN 92 832 1409 9 (out of print)

**Supplement No. 7****[Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42](#)**

1987; 440 pages

ISBN 92 832 1411 0 (out of print)

**Supplement No. 8****Cross Index of Synonyms and Trade Names in Volumes 1 to 46**

1989; 346 pages

ISBN 92 832 1417 X (out of print)

# Overall Evaluations of Carcinogenicity to Humans

As evaluated in *IARC Monographs* Volumes 1-88 (a total of 900 agents, mixtures and exposures)

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This list contains all hazards evaluated to date, according to the type of hazard posed and to the type of exposure. Where appropriate, chemical abstract numbers are given [in square brackets]. For details of the

evaluation, the relevant Monograph should be consulted (volume number given in round brackets, followed by year of publication of latest evaluation). Use a free-text search to find a particular compound.

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## **Group 1: Carcinogenic to humans (95)**

### **Agents and groups of agents**

Aflatoxins (naturally occurring mixtures of) [1402-68-2] (Vol. 56, Vol. 82; 2002)

4-Aminobiphenyl [92-67-1] (Vol. 1, Suppl. 7; 1987)

Arsenic [7440-38-2] and arsenic compounds (Vol. 23, Suppl. 7; 1987)

(NB: This evaluation applies to the group of compounds as a whole and not necessarily to all individual compounds within the group)

Asbestos [1332-21-4] (Vol. 14, Suppl. 7; 1987)

Azathioprine [446-86-6] (Vol. 26, Suppl. 7; 1987)

Benzene [71-43-2] (Vol. 29, Suppl. 7; 1987)

Benzidine [92-87-5] (Vol. 29, Suppl. 7; 1987)

Beryllium [7440-41-7] and beryllium compounds (Vol. 58; 1993)

(NB: Evaluated as a group)

*N,N*-Bis(2-chloroethyl)-2-naphthylamine (Chlornaphazine) [494-03-1] (Vol. 4, Suppl. 7; 1987)

Bis(chloromethyl)ether [542-88-1] and chloromethyl methyl ether [107-30-2] (technical-grade) (Vol. 4, Suppl. 7; 1987)

1,4-Butanediol dimethanesulfonate (Busulphan; Myleran) [55-98-1] (Vol. 4, Suppl. 7; 1987)

Cadmium [7440-43-9] and cadmium compounds (Vol. 58; 1993)

(NB: Evaluated as a group)

Chlorambucil [305-03-3] (Vol. 26, Suppl. 7; 1987)

1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea (Methyl-CCNU; Semustine) [13909-09-6] (Suppl. 7; 1987)

Chromium[VI] compounds (Vol. 49; 1990)

(NB: Evaluated as a group)

Ciclosporin [79217-60-0] (Vol. 50; 1990)

Cyclophosphamide [50-18-0] [6055-19-2] (Vol. 26, Suppl. 7; 1987)

Diethylstilboestrol [56-53-1] (Vol. 21, Suppl. 7; 1987)

Epstein-Barr virus (Vol. 70; 1997)

Erionite [66733-21-9] (Vol. 42, Suppl. 7; 1987)

Ethylene oxide [75-21-8] (Vol. 60; 1994)  
(NB: Overall evaluation upgraded from 2A to 1 with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Etoposide [33419-42-0] in combination with cisplatin and bleomycin (Vol. 76; 2000)

Formaldehyde [50-00-0] (Vol. 88; in preparation)

[Gamma Radiation: see X- and Gamma ( $\gamma$ )-Radiation]

Gallium arsenide [1303-00-0] (Vol. 86; in preparation)

*Helicobacter pylori* (infection with) (Vol. 61; 1994)

Hepatitis B virus (chronic infection with) (Vol. 59; 1994)

Hepatitis C virus (chronic infection with) (Vol. 59; 1994)

Herbal remedies containing plant species of the genus *Aristolochia* (Vol. 82; 2002)

Human immunodeficiency virus type 1 (infection with) (Vol. 67; 1996)

Human papillomavirus type 16 (Vol. 64; 1995)

Human papillomavirus type 18 (Vol. 64; 1995)

Human T-cell lymphotropic virus type I (Vol. 67; 1996)

Melphalan [148-82-3] (Vol. 9, Suppl. 7; 1987)

8-Methoxypsoralen (Methoxsalen) [298-81-7] plus ultraviolet A radiation (Vol. 24, Suppl. 7; 1987)

MOPP and other combined chemotherapy including alkylating agents (Suppl. 7; 1987)

Mustard gas (Sulfur mustard) [505-60-2] (Vol. 9, Suppl. 7; 1987)

2-Naphthylamine [91-59-8] (Vol. 4, Suppl. 7; 1987)

Neutrons (Vol. 75; 2000)  
(NB: Overall evaluation upgraded from 2B to 1 with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Nickel compounds (Vol. 49; 1990)  
(NB: Evaluated as a group)

Oestrogen therapy, postmenopausal (Vol. 72; 1999)

Oestrogens, nonsteroidal (Suppl. 7; 1987)  
(NB: This evaluation applies to the group of compounds as a whole and not necessarily to all individual compounds within the group)

Oestrogens, steroidal (Suppl. 7; 1987)  
(NB: This evaluation applies to the group of compounds as a whole and not necessarily to all individual compounds within the group)

*Opisthorchis viverrini* (infection with) (Vol. 61; 1994)

Oral contraceptives, combined (Vol. 72; 1999)

(NB: There is also conclusive evidence that these agents have a protective effect against cancers of the ovary and endometrium)

Oral contraceptives, sequential (Suppl. 7; 1987)

Phosphorus-32, as phosphate (Vol. 78; 2001)

Plutonium-239 and its decay products (may contain plutonium-240 and other isotopes), as aerosols (Vol. 78; 2001)

Radioiodines, short-lived isotopes, including iodine-131, from atomic reactor accidents and nuclear weapons detonation (exposure during childhood) (Vol. 78; 2001)

Radionuclides,  $\alpha$ -particle-emitting, internally deposited (Vol. 78; 2001)

(NB: Specific radionuclides for which there is *sufficient* evidence for carcinogenicity to humans are also listed individually as Group 1 agents)

Radionuclides,  $\beta$ -particle-emitting, internally deposited (Vol. 78; 2001)

(NB: Specific radionuclides for which there is *sufficient* evidence for carcinogenicity to humans are also listed individually as Group 1 agents)

Radium-224 and its decay products (Vol. 78; 2001)

Radium-226 and its decay products (Vol. 78; 2001)

Radium-228 and its decay products (Vol. 78; 2001)

Radon-222 [10043-92-2] and its decay products (Vol. 78; 2001)

*Schistosoma haematobium* (infection with) (Vol. 61; 1994)

Silica [14808-60-7], crystalline (inhaled in the form of quartz or cristobalite from occupational sources) (Vol. 68; 1997)

Solar radiation (Vol. 55; 1992)

Talc containing asbestiform fibres (Vol. 42, Suppl. 7; 1987)

Tamoxifen [10540-29-1] (Vol. 66; 1996)

(NB: There is also conclusive evidence that this agent (tamoxifen) reduces the risk of contralateral breast cancer)

2,3,7,8-Tetrachlorodibenzo-*para*-dioxin [1746-01-6] (Vol. 69; 1997)

(NB: Overall evaluation upgraded from 2A to 1 with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Thiotepa [52-24-4] (Vol. 50; 1990)

Thorium-232 and its decay products, administered intravenously as a colloidal dispersion of thorium-232 dioxide (Vol. 78; 2001)

Treosulfan [299-75-2] (Vol. 26, Suppl. 7; 1987)

Vinyl chloride [75-01-4] (Vol. 19, Suppl. 7; 1987)

X- and Gamma ( $\gamma$ )-Radiation (Vol. 75; 2000)

### **Mixtures**

Alcoholic beverages (Vol. 44; 1988)

Analgesic mixtures containing phenacetin (Suppl. 7; 1987)

Areca nut (Vol. 85; in preparation)

Betel quid with tobacco (Vol. 85; in preparation)

Betel quid without tobacco (Vol. 85; in preparation)

Coal-tar pitches [65996-93-2] (Vol. 35, Suppl. 7; 1987)

Coal-tars [8007-45-2] (Vol. 35, Suppl. 7; 1987)

Mineral oils, untreated and mildly treated (Vol. 33, Suppl. 7; 1987)

Salted fish (Chinese-style) (Vol. 56; 1993)

Shale-oils [68308-34-9] (Vol. 35, Suppl. 7; 1987)

Soots (Vol. 35, Suppl. 7; 1987)

Tobacco products, smokeless (Vol. 37, Suppl. 7; 1987)

Wood dust (Vol. 62; 1995)

### **Exposure circumstances**

Aluminium production (Vol. 34, Suppl. 7; 1987)

Arsenic in drinking-water (Vol. 84; in preparation)

Auramine, manufacture of (Suppl. 7; 1987)

Boot and shoe manufacture and repair (Vol. 25, Suppl. 7; 1987)

Coal gasification (Vol. 34, Suppl. 7; 1987)

Coke production (Vol. 34, Suppl. 7; 1987)

Furniture and cabinet making (Vol. 25, Suppl. 7; 1987)

Haematite mining (underground) with exposure to radon (Vol. 1, Suppl. 7; 1987)

Involuntary smoking (Vol. 83; 2004)

Iron and steel founding (Vol. 34, Suppl. 7; 1987)

Isopropanol manufacture (strong-acid process) (Suppl. 7; 1987)

Magenta, manufacture of (Vol. 57; 1993)

Painter (occupational exposure as a) (Vol. 47; 1989)

Rubber industry (Vol. 28, Suppl. 7; 1987)

Strong-inorganic-acid mists containing sulfuric acid (occupational exposure to) (Vol. 54; 1992)

Tobacco smoking (Vol. 38, Suppl. 7, Vol. 83; 2004)

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## **Group 2A: Probably carcinogenic to humans (66)**

### **Agents and groups of agents**

Acrylamide [79-06-1] (Vol. 60; 1994)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Adriamycin [23214-92-8] (Vol. 10, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Androgenic (anabolic) steroids (Suppl. 7; 1987)

Aristolochic acids (naturally occurring mixtures of) (Vol. 82; 2002)

Azacitidine [320-67-2] (Vol. 50; 1990)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Benz[*a*]anthracene [56-55-3] (Vol. 32, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Benzidine-based dyes (Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Benzo[*a*]pyrene [50-32-8] (Vol. 32, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Bischloroethyl nitrosourea (BCNU) [154-93-8] (Vol. 26, Suppl. 7; 1987)

1,3-Butadiene [106-99-0] (Vol. 71; 1999)

Captafol [2425-06-1] (Vol. 53; 1991)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Chloramphenicol [56-75-7] (Vol. 50; 1990)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

$\alpha$ -Chlorinated toluenes (benzal chloride [98-87-3], benzotrichloride [98-07-7], benzyl chloride [100-44-7]) and benzoyl chloride [98-88-4] (combined exposures) (Vol. 29, Suppl. 7, Vol. 71; 1999)

1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU) [13010-47-4] (Vol. 26, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

4-Chloro-*ortho*-toluidine [95-69-2] (Vol. 77; 2000)

Chlorozotocin [54749-90-5] (Vol. 50; 1990)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Cisplatin [15663-27-1] (Vol. 26, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

*Clonorchis sinensis* (infection with) (Vol. 61; 1994)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Dibenz[*a,h*]anthracene [53-70-3] (Vol. 32, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Diethyl sulfate [64-67-5] (Vol. 54, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Dimethylcarbamoyl chloride [79-44-7] (Vol. 12, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

1,2-Dimethylhydrazine [540-73-8] (Vol. 4, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Dimethyl sulfate [77-78-1] (Vol. 4, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Epichlorohydrin [106-89-8] (Vol. 11, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Ethylene dibromide [106-93-4] (Vol. 15, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

*N*-Ethyl-*N*-nitrosourea [759-73-9] (Vol. 17, Suppl.7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Etoposide [33419-42-0] (Vol. 76; 2000)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Glycidol [556-52-5] (Vol. 77; 2000)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Human papillomavirus type 31 (Vol. 64; 1995)

Human papillomavirus type 33 (Vol. 64; 1995)

Indium phosphide [22398-80-7] (Vol. 86; in preparation)

IQ (2-Amino-3-methylimidazo[4,5-*f*]quinoline) [76180-96-6] (Vol. 56; 1993)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Lead compounds, inorganic (Vol. 87; in preparation)

Kaposi's sarcoma herpesvirus/human herpesvirus 8 (Vol. 70; 1997)

5-Methoxypsoralen [484-20-8] (Vol. 40, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

4,4'-Methylene bis(2-chloroaniline) (MOCA) [101-14-4] (Vol.57; 1993)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Methyl methanesulfonate [66-27-3] (Vol. 7, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

*N*-Methyl-*N'*-nitro-*N*-nitrosoguanidine(MNNG) [70-25-7] (Vol. 4, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

*N*-Methyl-*N*-nitrosourea [684-93-5] (Vol. 17, Suppl.7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Nitrogen mustard [51-75-2] (Vol. 9, Suppl. 7; 1987)

*N*-Nitrosodiethylamine [55-18-5] (Vol. 17, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

*N*-Nitrosodimethylamine [62-75-9] (Vol. 17, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Phenacetin [62-44-2] (Vol. 24, Suppl. 7; 1987)

Procarbazine hydrochloride [366-70-1] (Vol. 26, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Styrene-7,8-oxide [96-09-3] (Vol. 60; 1994)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Teniposide [29767-20-2] (Vol. 76; 2000)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Tetrachloroethylene [127-18-4] (Vol. 63; 1995)

*ortho*-Toluidine [95-53-4] (Vol. 77; 2000)

Trichloroethylene [79-01-6] (Vol. 63; 1995)

1,2,3-Trichloropropane [96-18-4] (Vol. 63; 1995)

Tris(2,3-dibromopropyl) phosphate [126-72-7] (Vol. 20, Suppl. 7, Vol. 71;1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Ultraviolet radiation A (Vol. 55; 1992)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Ultraviolet radiation B (Vol. 55; 1992)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Ultraviolet radiation C (Vol. 55; 1992)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Vinyl bromide [593-60-2] (Vol. 39, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 2B to 2A with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Vinyl fluoride [75-02-5] (Vol. 63; 1995)

## **Mixtures**

Creosotes (from coal-tars) [8001-58-9] (Vol. 35, Suppl. 7; 1987)

Diesel engine exhaust (Vol. 46; 1989)

Hot mate (Vol. 51; 1991)

Non-arsenical insecticides (occupational exposures in spraying and application of) (Vol. 53; 1991)

Polychlorinated biphenyls [1336-36-3] (Vol. 18, Suppl. 7; 1987)

## **Exposure circumstances**

Art glass, glass containers and pressed ware (manufacture of) (Vol. 58; 1993)

Cobalt metal with tungsten carbide (Vol. 86; in preparation)

Hairdresser or barber (occupational exposure as a) (Vol. 57; 1993)

Petroleum refining (occupational exposures in) (Vol. 45; 1989)

Sunlamps and sunbeds (use of) (Vol. 55; 1992)

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## Group 2B: Possibly carcinogenic to humans (241)

### Agents and groups of agents

A- $\alpha$ -C (2-Amino-9H-pyrido[2,3-b]indole) [26148-68-5] (Vol. 40, Suppl. 7; 1987)

Acetaldehyde [75-07-0] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Acetamide [60-35-5] (Vol. 7, Suppl. 7, Vol. 71; 1999)

Acrylonitrile [107-13-1] (Vol. 71; 1999)

AF-2 [2-(2-Furyl)-3-(5-nitro-2-furyl)acrylamide] [3688-53-7] (Vol.31, Suppl. 7; 1987)

Aflatoxin M1 [6795-23-9] (Vol. 56; 1993)

*para*-Aminoazobenzene [60-09-3] (Vol. 8, Suppl. 7; 1987)

*ortho*-Aminoazotoluene [97-56-3] (Vol. 8, Suppl. 7; 1987)

2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazole [712-68-5] (Vol.7, Suppl. 7; 1987)

Amsacrine [51264-14-3] (Vol. 76; 2000)

*ortho*-Anisidine [90-04-0] (Vol. 73; 1999)

Antimony trioxide [1309-64-4] (Vol. 47; 1989)

Aramite® [140-57-8] (Vol. 5, Suppl. 7; 1987)

Auramine [492-80-8] (technical-grade) (Vol. 1, Suppl. 7; 1987)

Azaserine [115-02-6] (Vol. 10, Suppl. 7; 1987)

Aziridine [151-56-4] (Vol. 9, Suppl. 7, Vol. 71; 1999)

(NB: Overall evaluation upgraded from 3 to 2B with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Benzo[*b*]fluoranthene [205-99-2] (Vol. 32, Suppl. 7; 1987)

Benzo[*j*]fluoranthene [205-82-3] (Vol. 32, Suppl. 7; 1987)

Benzo[*k*]fluoranthene [207-08-9] (Vol. 32, Suppl. 7; 1987)

Benzofuran [271-89-6] (Vol. 63; 1995)

Benzyl violet 4B [1694-09-3] (Vol. 16, Suppl. 7; 1987)

2,2-Bis(bromomethyl)propane-1,3-diol [3296-90-0] (Vol. 77; 2000)

Bleomycins [11056-06-7] (Vol. 26, Suppl. 7; 1987)

(NB: Overall evaluation upgraded from 3 to 2B with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Bracken fern (Vol. 40, Suppl. 7; 1987)

Bromodichloromethane [75-27-4] (Vol. 52, Vol. 71; 1999)

Butylated hydroxyanisole (BHA) [25013-16-5] (Vol. 40, Suppl. 7; 1987)

$\beta$ -Butyrolactone [3068-88-0] (Vol. 11, Suppl. 7, Vol. 71; 1999)

Caffeic acid [331-39-5] (Vol. 56; 1993)

Carbon black [1333-86-4] (Vol. 65; 1996)

Carbon tetrachloride [56-23-5] (Vol. 20, Suppl. 7, Vol. 71; 1999)

Catechol [120-80-9] (Vol. 15, Suppl. 7, Vol. 71; 1999)

Chlordane [57-74-9] (Vol. 79; 2001)

Chlordecone (Kepone) [143-50-0] (Vol. 20, Suppl. 7; 1987)

Chlorendic acid [115-28-6] (Vol. 48; 1990)

*para*-Chloroaniline [106-47-8] (Vol. 57; 1993)

3-Chloro-4-(dichloromethyl)-5-hydroxy-2(5*H*)-furanone [77439-76-0] (Vol. 84; in preparation)

Chloroform [67-66-3] (Vol. 73; 1999)

1-Chloro-2-methylpropene [513-37-1] (Vol. 63; 1995)

Chlorophenoxy herbicides (Vol. 41, Suppl. 7; 1987)

4-Chloro-*ortho*-phenylenediamine [95-83-0] (Vol. 27, Suppl. 7; 1987)

Chloroprene [126-99-8] (Vol. 71; 1999)

Chlorothalonil [1897-45-6] (Vol. 73; 1999)

CI Acid Red 114 [6459-94-5] (Vol. 57; 1993)

CI Basic Red 9 [569-61-9] (Vol. 57; 1993)

CI Direct Blue 15 [2429-74-5] (Vol. 57; 1993)

Citrus Red No. 2 [6358-53-8] (Vol. 8, Suppl. 7; 1987)

Cobalt [7440-48-4] and cobalt compounds (Vol. 52; 1991)  
(NB: Evaluated as a group)

Cobalt sulfate [10026-24-1] and other soluble cobalt(II) salts (Vol. 86; in preparation)

*para*-Cresidine [120-71-8] (Vol. 27, Suppl. 7; 1987)

Cycasin [14901-08-7] (Vol. 10, Suppl. 7; 1987)

Dacarbazine [4342-03-4] (Vol. 26, Suppl. 7; 1987)

Dantron (Chrysazin; 1,8-Dihydroxyanthraquinone) [117-10-2] (Vol. 50; 1990)

Daunomycin [20830-81-3] (Vol. 10, Suppl. 7; 1987)

DDT [*p,p'*-DDT, 50-29-3] (Vol. 53; 1991)

*N,N'*-Diacetylbenzidine [613-35-4] (Vol. 16, Suppl.7; 1987)

2,4-Diaminoanisole [615-05-4] (Vol. 79; 2001)

4,4'-Diaminodiphenyl ether [101-80-4] (Vol. 29, Suppl. 7; 1987)

2,4-Diaminotoluene [95-80-7] (Vol. 16, Suppl. 7; 1987)

Dibenz[*a,h*]acridine [226-36-8] (Vol. 32, Suppl. 7; 1987)

Dibenz[*a,j*]acridine [224-42-0] (Vol. 32, Suppl. 7; 1987)

7*H*-Dibenzo[*c,g*]carbazole [194-59-2] (Vol. 32, Suppl.7; 1987)

Dibenzo[*a,e*]pyrene [192-65-4] (Vol. 32, Suppl. 7; 1987)

Dibenzo[*a,h*]pyrene [189-64-0] (Vol. 32, Suppl. 7; 1987)

Dibenzo[*a,i*]pyrene [189-55-9] (Vol. 32, Suppl. 7; 1987)

Dibenzo[*a,l*]pyrene [191-30-0] (Vol. 32, Suppl. 7; 1987)

1,2-Dibromo-3-chloropropane [96-12-8] (Vol. 20, Suppl. 7, Vol. 71; 1999)

2,3-Dibromopropan-1-ol [96-13-9] (Vol. 77; 2000)

Dichloroacetic acid [79-43-6] (Vol. 84; in preparation)

*para*-Dichlorobenzene [106-46-7] (Vol. 73; 1999)

3,3'-Dichlorobenzidine [91-94-1] (Vol. 29, Suppl. 7; 1987)

3,3'-Dichloro-4,4'-diaminodiphenyl ether [28434-86-8] (Vol. 16,Suppl. 7; 1987)

1,2-Dichloroethane [107-06-2] (Vol. 20, Suppl. 7, Vol. 71; 1999)

Dichloromethane (methylene chloride) [75-09-2] (Vol. 71; 1999)

1,3-Dichloropropene [542-75-6] (technical-grade) (Vol. 41, Suppl.7, Vol. 71; 1999)

Dichlorvos [62-73-7] (Vol. 53; 1991)

1,2-Diethylhydrazine [1615-80-1] (Vol. 4, Suppl. 7, Vol. 71; 1999)

Diglycidyl resorcinol ether [101-90-6] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Dihydrosafrole [94-58-6] (Vol. 10, Suppl. 7; 1987)

Diisopropyl sulfate [2973-10-6] (Vol. 54, Vol. 71; 1999)

3,3'-Dimethoxybenzidine (*ortho*-Dianisidine) [119-90-4](Vol. 4, Suppl. 7; 1987)

*para*-Dimethylaminoazobenzene [60-11-7] (Vol. 8, Suppl.7; 1987)

*trans*-2-[(Dimethylamino)methylimino]-5-[2-(5-nitro-2-furyl)-vinyl]-1,3,4-oxadiazole [25962-77-0] (Vol. 7, Suppl. 7; 1987)

2,6-Dimethylaniline (2,6-Xylidine) [87-62-7] (Vol. 57; 1993)

3,3'-Dimethylbenzidine (*ortho*-Tolidine) [119-93-7] (Vol.1, Suppl. 7; 1987)

1,1-Dimethylhydrazine [57-14-7] (Vol. 4, Suppl. 7, Vol. 71; 1999)

3,7-Dinitrofluoranthene [105735-71-5] (Vol. 65; 1996)

3,9-Dinitrofluoranthene [22506-53-2] (Vol. 65; 1996)

1,6-Dinitropyrene [42397-64-8] (Vol. 46; 1989)

1,8-Dinitropyrene [42397-65-9] (Vol. 46; 1989)

2,4-Dinitrotoluene [121-14-2] (Vol. 65; 1996)

2,6-Dinitrotoluene [606-20-2] (Vol. 65; 1996)

1,4-Dioxane [123-91-1] (Vol. 11, Suppl. 7, Vol. 71; 1999)

Disperse Blue 1 [2475-45-8] (Vol. 48; 1990)

1,2-Epoxybutane [106-88-7] (Vol. 47, Vol. 71; 1999)  
(NB: Overall evaluation upgraded from 3 to 2B with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Ethyl acrylate [140-88-5] (Vol. 39, Suppl. 7, Vol. 71; 1999)

Ethylbenzene [100-41-4] (Vol. 77; 2000)

Ethyl methanesulfonate [62-50-0] (Vol. 7, Suppl. 7; 1987)

Foreign bodies, implanted in tissues (Vol. 74; 1999)

- Polymeric, prepared as thin smooth films (with the exception of poly(glycolic acid))
- Metallic, prepared as thin smooth films
- Metallic cobalt, metallic nickel and an alloy powder containing 66-67% nickel, 13-16% chromium and 7% iron

2-(2-Formylhydrazino)-4-(5-nitro-2-furyl)thiazole [3570-75-0](Vol. 7, Suppl. 7; 1987)

Fumonisin B<sub>1</sub> [116355-83-0] (Vol. 82; 2002)

Furan [110-00-9] (Vol. 63; 1995)

Glu-P-1 (2-Amino-6-methyldipyrido[1,2-*a*:3',2'-*d*]imidazole) [67730-11-4] (Vol. 40, Suppl. 7; 1987)

Glu-P-2 (2-Aminodipyrido[1,2-*a*:3',2'-*d*]imidazole)[67730-10-3] (Vol. 40, Suppl. 7; 1987)

Glycidaldehyde [765-34-4] (Vol. 11, Suppl. 7, Vol. 71; 1999)

Griseofulvin [126-07-8] (Vol. 79; 2001)

HC Blue No. 1 [2784-94-3] (Vol. 57; 1993)

Heptachlor [76-44-8] (Vol. 79; 2001)

Hexachlorobenzene [118-74-1] (Vol. 79; 2001)

Hexachloroethane [67-72-1] (Vol. 73; 1999)

Hexachlorocyclohexanes (Vol. 20, Suppl. 7; 1987)

Hexamethylphosphoramide [680-31-9] (Vol. 15, Suppl. 7, Vol. 71; 1999)

Human immunodeficiency virus type 2 (infection with) (Vol. 67;1996)

Human papillomaviruses: some types other than 16, 18, 31 and 33 (Vol. 64; 1995)

Hydrazine [302-01-2] (Vol. 4, Suppl. 7, Vol. 71; 1999)

1-Hydroxyanthraquinone [129-43-1] (Vol. 82; 2002)

Indeno[1,2,3-*cd*]pyrene [193-39-5] (Vol. 32, Suppl. 7; 1987)

Iron-dextran complex [9004-66-4] (Vol. 2, Suppl. 7; 1987)

Isoprene [78-79-5] (Vol. 60, Vol. 71; 1999)

Lasiocarpine [303-34-4] (Vol. 10, Suppl. 7; 1987)

Lead [7439-92-1] (Vol. 23, Suppl.7; 1987)

Magenta [632-99-5] (containing CI Basic Red 9) (Vol. 57; 1993)

Magnetic fields (extremely low-frequency) (Vol. 80; 2002)

MeA- $\alpha$ -C (2-Amino-3-methyl-9*H*-pyrido[2,3-*b*]indole) [68006-83-7] (Vol. 40, Suppl. 7; 1987)

Medroxyprogesterone acetate [71-58-9] (Vol. 21, Suppl. 7; 1987)

MeIQ (2-Amino-3,4-dimethylimidazo[4,5-*f*]quinoline) [77094-11-2] (Vol. 56; 1993)

MeIQx (2-Amino-3,8-dimethylimidazo[4,5-*f*]quinoxaline) [77500-04-0] (Vol. 56; 1993)

Merphalan [531-76-0] (Vol. 9, Suppl. 7; 1987)

2-Methylaziridine (Propyleneimine) [75-55-8] (Vol. 9, Suppl. 7, Vol. 71; 1999)

Methylazoxymethanol acetate [592-62-1] (Vol. 10, Suppl. 7; 1987)

5-Methylchrysene [3697-24-3] (Vol. 32, Suppl. 7; 1987)

4,4'-Methylene bis(2-methylaniline) [838-88-0] (Vol. 4, Suppl.7; 1987)

4,4'-Methylenedianiline [101-77-9] (Vol. 39, Suppl. 7; 1987)

Methylmercury compounds (Vol. 58; 1993)  
(NB: Evaluated as a group)

2-Methyl-1-nitroanthraquinone [129-15-7] (uncertain purity) (Vol.27, Suppl. 7; 1987)

*N*-Methyl-*N*-nitrosourethane [615-53-2] (Vol. 4, Suppl.7; 1987)

Methylthiouracil [56-04-2] (Vol. 79; 2001)

Metronidazole [443-48-1] (Vol. 13, Suppl. 7; 1987)

Mirex [2385-85-5] (Vol. 20, Suppl. 7; 1987)

Mitomycin C [50-07-7] (Vol. 10, Suppl. 7; 1987)

Mitoxantrone [65271-80-9] (Vol. 76; 2000)

Monocrotaline [315-22-0] (Vol. 10, Suppl. 7; 1987)

5-(Morpholinomethyl)-3-[(5-nitrofurfurylidene)amino]-2-oxazolidinone [3795-88-8] (Vol. 7, Suppl. 7; 1987)

Nafenopin [3771-19-5] (Vol. 24, Suppl. 7; 1987)

Naphthalene [91-20-3] (Vol. 82; 2002)

Nickel, metallic [7440-02-0] and alloys (Vol. 49; 1990)

Niridazole [61-57-4] (Vol. 13, Suppl. 7; 1987)

Nitrilotriacetic acid [139-13-9] and its salts (Vol. 73; 1999)  
(NB: Evaluated as a group)

5-Nitroacenaphthene [602-87-9] (Vol. 16, Suppl. 7; 1987)

2-Nitroanisole [91-23-6] (Vol. 65; 1996)

Nitrobenzene [98-95-3] (Vol. 65; 1996)

6-Nitrochrysene [7496-02-8] (Vol. 46; 1989)

Nitrofen [1836-75-5] (technical-grade) (Vol. 30, Suppl. 7; 1987)

2-Nitrofluorene [607-57-8] (Vol. 46; 1989)

1-[(5-Nitrofurfurylidene)amino]-2-imidazolidinone [555-84-0] (Vol.7, Suppl. 7; 1987)

*N*-[4-(5-Nitro-2-furyl)-2-thiazolyl]acetamide [531-82-8] (Vol. 7, Suppl. 7; 1987)

Nitrogen mustard *N*-oxide [126-85-2] (Vol. 9, Suppl. 7;1987)

Nitromethane [75-52-5] (Vol. 77; 2000)

2-Nitropropane [79-46-9] (Vol. 29, Suppl. 7, Vol. 71; 1999)

1-Nitropyrene [5522-43-0] (Vol. 46; 1989)

4-Nitropyrene [57835-92-4] (Vol. 46; 1989)

*N*-Nitrosodi-*n*-butylamine [924-16-3] (Vol. 17, Suppl.7; 1987)

*N*-Nitrosodiethanolamine [1116-54-7] (Vol. 17, Suppl. 7, Vol. 77;2000)

*N*-Nitrosodi-*n*-propylamine [621-64-7] (Vol. 17, Suppl.7; 1987)

3-(*N*-Nitrosomethylamino)propionitrile [60153-49-3] (Vol. 85; in preparation)

4-(*N*-Nitrosomethylamino)-1-(3-pyridyl)-1-butanone (NNK)[64091-91-4] (Vol. 37, Suppl. 7; 1987)

*N*-Nitrosomethylethylamine [10595-95-6] (Vol. 17, Suppl.7; 1987)

*N*-Nitrosomethylvinylamine [4549-40-0] (Vol. 17, Suppl.7; 1987)

*N*-Nitrosomorpholine [59-89-2] (Vol. 17, Suppl. 7; 1987)

*N'*-Nitrososornicotine (NNN) [16543-55-8] (Vol. 37, Suppl. 7;1987)

*N*-Nitrosopiperidine [100-75-4] (Vol. 17, Suppl. 7; 1987)

*N*-Nitrosopyrrolidine [930-55-2] (Vol. 17, Suppl. 7; 1987)

*N*-Nitrososarcosine [13256-22-9] (Vol. 17, Suppl. 7; 1987)

Ochratoxin A [303-47-9] (Vol. 56; 1993)

Oestrogen-progestogen therapy, postmenopausal (Vol. 72; 1999)

Oil Orange SS [2646-17-5] (Vol. 8, Suppl. 7; 1987)

Oxazepam [604-75-1] (Vol. 66; 1996)

Palygorskite (attapulgitite) [12174-11-7] (long fibres, > 5 micrometers) (Vol. 68; 1997)

Panfuran S [794-93-4] (containing dihydroxymethylfuratrizine)  
(Vol. 24, Suppl. 7; 1987)

Phenazopyridine hydrochloride [136-40-3] (Vol. 24, Suppl. 7; 1987)

Phenobarbital [50-06-6] (Vol. 79; 2001)

Phenolphthalein [77-09-8] (Vol. 76; 2000)

Phenoxybenzamine hydrochloride [63-92-3] (Vol. 24, Suppl. 7; 1987)

Phenyl glycidyl ether [122-60-1] (Vol. 47, Vol. 71; 1999)

Phenytoin [57-41-0] (Vol. 66; 1996)

PhIP (2-Amino-1-methyl-6-phenylimidazo[4,5-*b*]pyridine) [105650-23-5] (Vol. 56; 1993)

Polychlorophenols and their sodium salts (mixed exposures) (Vol. 41, Suppl. 7, Vol. 53, Vol. 71; 1999)

Ponceau MX [3761-53-3] (Vol. 8, Suppl. 7; 1987)

Ponceau 3R [3564-09-8] (Vol. 8, Suppl. 7; 1987)

Potassium bromate [7758-01-2] (Vol. 73; 1999)

Progestins (Suppl. 7; 1987)

Progestogen-only contraceptives (Vol. 72; 1999)

1,3-Propane sultone [1120-71-4] (Vol. 4, Suppl. 7, Vol. 71; 1999)

β-Propiolactone [57-57-8] (Vol. 4, Suppl. 7, Vol. 71; 1999)

Propylene oxide [75-56-9] (Vol. 60; 1994)

Propylthiouracil [51-52-5] (Vol. 79; 2001)

Refractory ceramic fibres (Vol. 43, Vol. 81; 2002)

Riddelliine [23246-96-0] (Vol. 10, Suppl. 7, Vol. 82; 2002)

Safrole [94-59-7] (Vol. 10, Suppl. 7; 1987)

*Schistosoma japonicum* (infection with) (Vol. 61; 1994)

Sodium *ortho*-phenylphenate [132-27-4] (Vol. 73; 1999)

Special-purpose fibres such as E-glass and '475' glass fibres (Vol. 81; 2002)

Sterigmatocystin [10048-13-2] (Vol. 10, Suppl. 7; 1987)

Streptozotocin [18883-66-4] (Vol. 17, Suppl. 7; 1987)

Styrene [100-42-5] (Vol. 60, 82; 2002)  
(NB: Overall evaluation upgraded from 3 to 2B with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Sulfallate [95-06-7] (Vol. 30, Suppl. 7; 1987)

Tetrafluoroethylene [116-14-3] (Vol. 19, Suppl. 7, Vol. 71; 1999)

Tetranitromethane [509-14-8] (Vol. 65; 1996)

Thioacetamide [62-55-5] (Vol. 7, Suppl. 7; 1987)

4,4'-Thiodianiline [139-65-1] (Vol. 27, Suppl. 7; 1987)

Thiouracil [141-90-2] (Vol. 79; 2001)

Toluene diisocyanates [26471-62-5] (Vol. 39, Suppl. 7, Vol. 71; 1999)

Trichlormethine (Trimustine hydrochloride) [817-09-4] (Vol. 50; 1990)

Trp-P-1 (3-Amino-1,4-dimethyl-5*H*-pyrido[4,3-*b*]indole)[62450-06-0] (Vol. 31, Suppl. 7; 1987)

Trp-P-2 (3-Amino-1-methyl-5*H*-pyrido[4,3-*b*]indole)[62450-07-1] (Vol. 31, Suppl. 7; 1987)

Trypan blue [72-57-1] (Vol. 8, Suppl. 7; 1987)

Uracil mustard [66-75-1] (Vol. 9, Suppl. 7; 1987)

Urethane [51-79-6] (Vol. 7, Suppl. 7; 1987)

Vanadium pentoxide [1314-62-1] (Vol. 86; in preparation)

Vinyl acetate [108-05-4] (Vol. 63; 1995)

4-Vinylcyclohexene [100-40-3] (Vol. 60; 1994)

4-Vinylcyclohexene diepoxide [106-87-6] (Vol. 60; 1994)

Zalcitabine [7481-89-2] (Vol. 76; 2000)

Zidovudine (AZT) [30516-87-1] (Vol. 76; 2000)

## **Mixtures**

Bitumens [8052-42-4], extracts of steam-refined and air-refined (Vol. 35, Suppl. 7; 1987)

Carrageenan [9000-07-1], degraded (Vol. 31, Suppl. 7; 1987)

Chlorinated paraffins of average carbon chain length C12 and average degree of chlorination approximately 60% (Vol. 48; 1990)

Coffee (urinary bladder) (Vol. 51; 1991)

(NB: There is some evidence of an inverse relationship between coffee drinking and cancer of the large bowel; coffee drinking could not be classified as to its carcinogenicity to other organs)

Diesel fuel, marine (Vol. 45; 1989)

(NB: Overall evaluation upgraded from 3 to 2B with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Engine exhaust, gasoline (Vol. 46; 1989)

Fuel oils, residual (heavy) (Vol. 45; 1989)

Gasoline (Vol. 45; 1989)

(NB: Overall evaluation upgraded from 3 to 2B with supporting evidence from other data relevant to the evaluation of carcinogenicity and its mechanisms)

Pickled vegetables (traditional in Asia) (Vol. 56; 1993)

Polybrominated biphenyls [Firemaster BP-6, 59536-65-1] (Vol. 41, Suppl. 7; 1987)

Toxaphene (Polychlorinated camphenes) [8001-35-2] (Vol. 79; 2001)

Toxins derived from *Fusarium moniliforme* (Vol. 56; 1993)

Welding fumes (Vol. 49; 1990)

## **Exposure circumstances**

Carpentry and joinery (Vol. 25, Suppl. 7; 1987)

Cobalt metal without tungsten carbide (Vol. 86; in preparation)

Dry cleaning (occupational exposures in) (Vol. 63; 1995)

Printing processes (occupational exposures in) (Vol. 65; 1996)

Textile manufacturing industry (work in) (Vol. 48; 1990)

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## **Group 3: Not classifiable as to carcinogenicity to humans (497)**

### **Agents and groups of agents**

Aciclovir [59277-89-3] (Vol. 76; 2000)

Acridine orange [494-38-2] (Vol. 16, Suppl. 7; 1987)

Acriflavium chloride [8018-07-3] (Vol. 13, Suppl. 7; 1987)

Acrolein [107-02-8] (Vol. 63; 1995)

Acrylic acid [79-10-7] (Vol. 19, Suppl. 7, Vol. 71; 1999)

Acrylic fibres (Vol. 19, Suppl. 7; 1987)

Acrylonitrile-butadiene-styrene copolymers (Vol. 19, Suppl. 7; 1987)

Actinomycin D [50-76-0] (Vol. 10, Suppl. 7; 1987)

Agaritrine [2757-90-6] (Vol. 31, Suppl. 7; 1987)

Aldicarb [116-06-3] (Vol. 53; 1991)

Aldrin [309-00-2] (Vol. 5, Suppl. 7; 1987)

Allyl chloride [107-05-1] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Allyl isothiocyanate [57-06-7] (Vol. 73; 1999)

Allyl isovalerate [2835-39-4] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Amaranth [915-67-3] (Vol. 8, Suppl. 7; 1987)

5-Aminoacenaphthene [4657-93-6] (Vol. 16, Suppl. 7; 1987)

2-Aminoanthraquinone [117-79-3] (Vol. 27, Suppl. 7; 1987)

*para*-Aminobenzoic acid [150-13-0] (Vol. 16, Suppl. 7; 1987)

1-Amino-2-methylantraquinone [82-28-0] (Vol. 27, Suppl. 7; 1987)

2-Amino-4-nitrophenol [99-57-0] (Vol. 57; 1993)

2-Amino-5-nitrophenol [121-88-0] (Vol. 57; 1993)

4-Amino-2-nitrophenol [119-34-6] (Vol. 16, Suppl. 7; 1987)

2-Amino-5-nitrothiazole [121-66-4] (Vol. 31, Suppl. 7; 1987)

11-Aminoundecanoic acid [2432-99-7] (Vol. 39, Suppl. 7; 1987)

Amitrole [61-82-5] (Vol. 79; 2001)  
(NB: Overall evaluation downgraded from 2B to 3 with supporting evidence from other data relevant to carcinogenicity and its mechanisms)

Ampicillin [69-53-4] (Vol. 50; 1990)

Anaesthetics, volatile (Vol. 11, Suppl. 7; 1987)

Angelicin [523-50-2] plus ultraviolet A radiation (Vol. 40, Suppl. 7; 1987)

Aniline [62-53-3] (Vol. 27, Suppl. 7; 1987)

*para*-Anisidine [104-94-9] (Vol. 27, Suppl. 7; 1987)

Anthanthrene [191-26-4] (Vol. 32, Suppl. 7; 1987)

Anthracene [120-12-7] (Vol. 32, Suppl. 7; 1987)

Anthranilic acid [118-92-3] (Vol. 16, Suppl. 7; 1987)

Antimony trisulfide [1345-04-6] (Vol. 47; 1989)

Apholate [52-46-0] (Vol. 9, Suppl. 7; 1987)

*para*-Aramid fibrils [24938-64-5] (Vol. 68; 1997)

Atrazine [1912-24-9] (Vol. 73; 1999)  
(NB: Overall evaluation downgraded from 2B to 3 with supporting evidence from other data relevant to carcinogenicity and its mechanisms)

Aurothioglucose [12192-57-3] (Vol. 13, Suppl. 7; 1987)

2-(1-Aziridinyl)ethanol [1072-52-2] (Vol. 9, Suppl. 7; 1987)

Aziridyl benzoquinone [800-24-8] (Vol. 9, Suppl. 7; 1987)

Azobenzene [103-33-3] (Vol. 8, Suppl. 7; 1987)

Benz[*a*]acridine [225-11-6] (Vol. 32, Suppl. 7; 1987)

Benz[*c*]acridine [225-51-4] (Vol. 32, Suppl. 7; 1987)

Benzo[*ghi*]fluoranthene [203-12-3] (Vol. 32, Suppl. 7; 1987)

Benzo[*a*]fluorene [238-84-6] (Vol. 32, Suppl. 7; 1987)

Benzo[*b*]fluorene [243-17-4] (Vol. 32, Suppl. 7; 1987)

Benzo[*c*]fluorene [205-12-9] (Vol. 32, Suppl. 7; 1987)

Benzo[*ghi*]perylene [191-24-2] (Vol. 32, Suppl. 7; 1987)

Benzo[*c*]phenanthrene [195-19-7] (Vol. 32, Suppl. 7; 1987)

Benzo[*e*]pyrene [192-97-2] (Vol. 32, Suppl. 7; 1987)

*para*-Benzoquinone dioxime [105-11-3] (Vol. 29, Suppl. 7, Vol. 71; 1999)

Benzoyl peroxide [94-36-0] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Benzyl acetate [140-11-4] (Vol. 40, Suppl. 7, Vol. 71; 1999)

Bis(1-aziridinyl)morpholinophosphine sulfide [2168-68-5] (Vol.9, Suppl. 7; 1987)

Bis(2-chloroethyl)ether [111-44-4] (Vol. 9, Suppl. 7, Vol. 71; 1999)

1,2-Bis(chloromethoxy)ethane [13483-18-6] (Vol. 15; Suppl. 7, Vol. 71; 1999)

1,4-Bis(chloromethoxymethyl)benzene [56894-91-8] (Vol. 15, Suppl. 7, Vol. 71; 1999)

Bis(2-chloro-1-methylethyl)ether [108-60-1] (Vol. 41, Suppl. 7, Vol. 71; 1999)

Bis(2,3-epoxycyclopentyl)ether [2386-90-5] (Vol. 47, Vol. 71; 1999)

Bisphenol A diglycidyl ether (Araldite<sup>®</sup>) [1675-54-3] (Vol. 47, Vol. 71; 1999)

Bisulfites (Vol. 54; 1992)

Blue VRS [129-17-9] (Vol. 16, Suppl. 7; 1987)

Brilliant Blue FCF, disodium salt [3844-45-9] (Vol. 16, Suppl.7; 1987)

Bromochloroacetonitrile [83463-62-1] (Vol. 52, Vol. 71; 1999)

Bromoethane [74-96-4] (Vol. 52, Vol. 71; 1999)

Bromoform [75-25-2] (Vol. 52, Vol. 71; 1999)

2-Butoxyethanol [111-76-2] (Vol. 88; in preparation)

1-*tert*-Butoxy-2-propanol [57018-52-7] (Vol. 88; in preparation)

*n*-Butyl acrylate [141-32-2] (Vol. 39, Suppl. 7, Vol. 71; 1999)

Butylated hydroxytoluene (BHT) [128-37-0] (Vol. 40, Suppl. 7;1987)

Butyl benzyl phthalate [85-68-7] (Vol. 73; 1999)

$\gamma$ -Butyrolactone [96-48-0] (Vol. 11, Suppl. 7, Vol. 71; 1999)

Caffeine [58-08-2] (Vol. 51; 1991)

Cantharidin [56-25-7] (Vol. 10, Suppl. 7; 1987)

Captan [133-06-2] (Vol. 30, Suppl. 7; 1987)

Carbaryl [63-25-2] (Vol. 12, Suppl. 7; 1987)

Carbazole [86-74-8] (Vol. 32, Suppl. 7, Vol. 71; 1999)

3-Carbethoxypsoralen [20073-24-9] (Vol. 40, Suppl. 7; 1987)

Carmoisine [3567-69-9] (Vol. 8, Suppl. 7; 1987)

Carrageenan [9000-07-1], native (Vol. 31, Suppl. 7; 1987)

Chloral [75-87-6] (Vol. 63; 1995)

Chloral hydrate [302-17-0] (Vol. 84; in preparation)

Chloramine [10599-90-3] (Vol. 84; in preparation)

Chlordimeform [6164-98-3] (Vol. 30, Suppl. 7; 1987)

Chlorinated drinking-water (Vol. 52; 1991)

Chloroacetonitrile [107-14-2] (Vol. 52, Vol. 71; 1999)

Chlorobenzilate [510-15-6] (Vol. 30, Suppl. 7; 1987)

Chlorodibromomethane [124-48-1] (Vol. 52, Vol. 71; 1999)

Chlorodifluoromethane [75-45-6] (Vol. 41, Suppl. 7, Vol. 71; 1999)

Chloroethane [75-00-3] (Vol. 52, Vol. 71; 1999)

Chlorofluoromethane [593-70-4] (Vol. 41, Suppl. 7, Vol. 71; 1999)

3-Chloro-2-methylpropene [563-47-3] (Vol. 63; 1995)

4-Chloro-*meta*-phenylenediamine [5131-60-2] (Vol. 27, Suppl.7; 1987)

Chloronitrobenzenes [88-73-3; 121-73-3; 100-00-5] (Vol. 65; 1996)

Chloropropham [101-21-3] (Vol. 12, Suppl. 7; 1987)

Chloroquine [54-05-7] (Vol. 13, Suppl. 7; 1987)

5-Chloro-*ortho*-toluidine [95-79-4] (Vol. 77; 2000)

2-Chloro-1,1,1-trifluoroethane [75-88-7] (Vol. 41, Suppl. 7, Vol. 71; 1999)

Cholesterol [57-88-5] (Vol. 31, Suppl. 7; 1987)

Chromium[III] compounds (Vol. 49; 1990)

Chromium [7440-47-3], metallic (Vol. 49; 1990)

Chrysene [218-01-9] (Vol. 32, Suppl. 7; 1987)

Chrysoidine [532-82-1] (Vol. 8, Suppl. 7; 1987)

CI Acid Orange 3 [6373-74-6] (Vol. 57; 1993)

Cimetidine [51481-61-9] (Vol. 50; 1990)

Cinnamyl anthranilate [87-29-6] (Vol. 77; 2000)

CI Pigment Red 3 [2425-85-6] (Vol. 57; 1993)

Citrinin [518-75-2] (Vol. 40, Suppl. 7; 1987)

Clofibrate [637-07-0] (Vol. 66; 1996)

Clomiphene citrate [50-41-9] (Vol. 21, Suppl. 7; 1987)

Coal dust (Vol. 68; 1997)

Continuous glass filament (Vol. 43, Vol. 81; 2002)

Copper 8-hydroxyquinoline [10380-28-6] (Vol. 15, Suppl. 7; 1987)

Coronene [191-07-1] (Vol. 32, Suppl. 7; 1987)

Coumarin [91-64-5] (Vol. 77; 2000)

*meta*-Cresidine [102-50-1] (Vol. 27, Suppl. 7; 1987)

Crotonaldehyde [4170-30-3] (Vol. 63; 1995)

Cyclamates [sodium cyclamate, 139-05-9] (Vol. 73; 1999)

Cyclochlorotine [12663-46-6] (Vol. 10, Suppl. 7; 1987)

Cyclohexanone [108-94-1] (Vol. 47, Vol. 71; 1999)

Cyclopenta[*cd*]pyrene [27208-37-3] (Vol. 32, Suppl. 7; 1987)

D & C Red No. 9 [5160-02-1] (Vol. 57; 1993)

Dapsone [80-08-0] (Vol. 24, Suppl. 7; 1987)

Decabromodiphenyl oxide [1163-19-5] (Vol. 48, Vol. 71; 1999)

Deltamethrin [52918-63-5] (Vol. 53; 1991)

Diacetylaminoazotoluene [83-63-6] (Vol. 8, Suppl. 7; 1987)

Diallate [2303-16-4] (Vol. 30, Suppl. 7; 1987)

1,2-Diamino-4-nitrobenzene [99-56-9] (Vol. 16, Suppl. 7; 1987)

1,4-Diamino-2-nitrobenzene [5307-14-2] (Vol. 57; 1993)

2,5-Diaminotoluene [95-70-5] (Vol. 16, Suppl. 7; 1987)

Diazepam [439-14-5] (Vol. 66; 1996)

Diazomethane [334-88-3] (Vol. 7, Suppl. 7; 1987)

Dibenz[*a,c*]anthracene [215-58-7] (Vol. 32, Suppl. 7; 1987)

Dibenz[*a,j*]anthracene [224-41-9] (Vol. 32, Suppl. 7; 1987)

Dibenzo-*para*-dioxin (Vol. 69; 1997)

Dibenzo[*a,e*]fluoranthene [5385-75-1] (Vol. 32, Suppl. 7; 1987)

Dibenzo[*h,rst*]pentaphene [192-47-2] (Vol. 3, Suppl. 7; 1987)

Dibromoacetonitrile [3252-43-5] (Vol. 52, Vol. 71; 1999)

Dichloroacetonitrile [3018-12-0] (Vol. 52, Vol. 71; 1999)

Dichloroacetylene [7572-29-4] (Vol. 39, Suppl. 7, Vol. 71; 1999)

*meta*-Dichlorobenzene [541-73-1] (Vol. 73; 1999)

*ortho*-Dichlorobenzene [95-50-1] (Vol. 73; 1999)

*trans*-1,4-Dichlorobutene [110-57-6] (Vol. 15, Suppl. 7, Vol. 71; 1999)

2,6-Dichloro-*para*-phenylenediamine [609-20-1] (Vol. 39, Suppl. 7; 1987)

1,2-Dichloropropane [78-87-5] (Vol. 41, Suppl. 7, Vol. 71; 1999)

Dicofol [115-32-2] (Vol. 30, Suppl. 7; 1987)

Didanosine [69655-05-6] (Vol. 76; 2000)

Dieldrin [60-57-1] (Vol. 5, Suppl. 7; 1987)

Diethanolamine [111-42-2] (Vol. 77; 2000)

Di(2-ethylhexyl) adipate [103-23-1] (Vol. 77; 2000)

Di(2-ethylhexyl) phthalate [117-81-7] (Vol. 77; 2000)  
(NB: Overall evaluation downgraded from 2B to 3 with supporting evidence from other data relevant to carcinogenicity and its mechanisms)

*N,N'*-Diethylthiourea [105-55-5] (Vol. 79; 2001)

Dihydroxymethylfuratrizine [794-93-4] (Vol. 24, Suppl. 7; 1987)

Dimethoxane [828-00-2] (Vol. 15, Suppl. 7; 1987)

3,3'-Dimethoxybenzidine-4,4'-diisocyanate [91-93-0] (Vol. 39, Suppl. 7; 1987)

*para*-Dimethylaminoazobenzene diazo sodium sulfonate [140-56-7] (Vol. 8, Suppl. 7; 1987)

4,4'-Dimethylangelicin [22975-76-4] plus ultraviolet A radiation (Suppl. 7; 1987)

4,5'-Dimethylangelicin [4063-41-6] plus ultraviolet A radiation (Suppl. 7; 1987)

*N,N*-Dimethylaniline [121-69-7] (Vol. 57; 1993)

Dimethylformamide [68-12-2] (Vol. 47; Vol. 71; 1999)

Dimethyl hydrogen phosphite [868-85-9] (Vol. 48, Vol. 71; 1999)

1,4-Dimethylphenanthrene [22349-59-3] (Vol. 32, Suppl. 7; 1987)

1,3-Dinitropyrene [75321-20-9] (Vol. 46; 1989)

3,5-Dinitrotoluene [618-85-9] (Vol. 65; 1996)

Dinitrosopentamethylenetetramine [101-25-7] (Vol. 11, Suppl. 7; 1987)

2,4'-Diphenyldiamine [492-17-1] (Vol. 16, Suppl. 7; 1987)

Disperse Yellow 3 [2832-40-8] (Vol. 48; 1990)

Disulfiram [97-77-8] (Vol. 12, Suppl. 7; 1987)

Dithranol [1143-38-0] (Vol. 13; Suppl. 7; 1987)

Doxefazepam [40762-15-0] (Vol. 66; 1996)

Doxylamine succinate [562-10-7] (Vol. 79; 2001)

Droloxifene [82413-20-5] (Vol. 66; 1996)

Dulcin [150-69-6] (Vol. 12, Suppl. 7; 1987)

Electric fields (extremely low-frequency) (Vol. 80; 2002)

Electric fields (static) (Vol. 80; 2002)

Endrin [72-20-8] (Vol. 5, Suppl. 7; 1987)

Eosin [15086-94-9] (Vol. 15, Suppl. 7; 1987)

3,4-Epoxy-6-methylcyclohexylmethyl-3,4-epoxy-6-methylcyclo-hexanecarboxylate [141-37-7]  
(Vol. 11, Suppl. 7, Vol. 71; 1999)

*cis*-9,10-Epoxy stearic acid [2443-39-2] (Vol. 11, Suppl. 7, Vol. 71; 1999)

Estazolam [29975-16-4] (Vol. 66; 1996)

Ethionamide [536-33-4] (Vol. 13, Suppl. 7; 1987)

Ethylene [74-85-1] (Vol. 60; 1994)

Ethylene sulfide [420-12-2] (Vol. 11, Suppl. 7; 1987)

Ethylenethiourea [96-45-7] (Vol. 79; 2001)

(NB: Overall evaluation downgraded from 2B to 3 with supporting evidence from other data relevant to carcinogenicity and its mechanisms)

2-Ethylhexyl acrylate [103-11-7] (Vol. 60; 1994)

Ethyl selenac [5456-28-0] (Vol. 12, Suppl. 7; 1987)

Ethyl tellurac [20941-65-5] (Vol. 12, Suppl. 7; 1987)

Eugenol [97-53-0] (Vol. 36, Suppl. 7; 1987)

Evans blue [314-13-6] (Vol. 8, Suppl. 7; 1987)

Fast Green FCF [2353-45-9] (Vol. 16, Suppl. 7; 1987)

Fenvalerate [51630-58-1] (Vol. 53; 1991)

Ferbam [14484-64-1] (Vol. 12, Suppl. 7; 1987)

Ferric oxide [1309-37-1] (Vol. 1, Suppl. 7; 1987)

Fluometuron [2164-17-2] (Vol. 30, Suppl. 7; 1987)

Fluoranthene [206-44-0] (Vol. 32, Suppl. 7; 1987)

Fluorene [86-73-7] (Vol. 32, Suppl. 7; 1987)

Fluorescent lighting (Vol. 55; 1992)

Fluorides (inorganic, used in drinking-water) (Vol. 27, Suppl.7; 1987)

5-Fluorouracil [51-21-8] (Vol. 26, Suppl. 7; 1987)

Foreign bodies, implanted in tissues (Vol. 74; 1999)

Metallic chromium or titanium, cobalt-based, chromium-based and titanium-based alloys, stainless steel and depleted uranium

Furazolidone [67-45-8] (Vol. 31, Suppl. 7; 1987)

Furfural [98-01-1] (Vol. 63; 1995)

Furosemide (Frusemide) [54-31-9] (Vol. 50; 1990)

Gemfibrozil [25812-30-0] (Vol. 66; 1996)

Glycidyl oleate [5431-33-4] (Vol. 11, Suppl. 7; 1987)

Glycidyl stearate [7460-84-6] (Vol. 11, Suppl. 7; 1987)

Guinea Green B [4680-78-8] (Vol. 16, Suppl. 7; 1987)

Gyromitrin [16568-02-8] (Vol. 31, Suppl. 7; 1987)

Haematite [1317-60-8] (Vol. 1, Suppl. 7; 1987)

HC Blue No. 2 [33229-34-4] (Vol. 57; 1993)

HC Red No. 3 [2871-01-4] (Vol. 57; 1993)

HC Yellow No. 4 [59820-43-8] (Vol. 57; 1993)

Hepatitis D virus (Vol. 59; 1994)

Hexachlorobutadiene [87-68-3] (Vol. 73; 1999)

Hexachlorophene [70-30-4] (Vol. 20, Suppl. 7; 1987)

Human T-cell lymphotropic virus type II (Vol. 67; 1996)

Hycanthone mesylate [23255-93-8] (Vol. 13, Suppl. 7; 1987)

Hydralazine [86-54-4] (Vol. 24, Suppl. 7; 1987)

Hydrochloric acid [7647-01-0] (Vol. 54; 1992)

Hydrochlorothiazide [58-93-5] (Vol. 50; 1990)

Hydrogen peroxide [7722-84-1] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Hydroquinone [123-31-9] (Vol. 15, Suppl. 7, Vol. 71; 1999)

4-Hydroxyazobenzene [1689-82-3] (Vol. 8, Suppl. 7; 1987)

8-Hydroxyquinoline [148-24-3] (Vol. 13, Suppl. 7; 1987)

Hydroxysenkirkine [26782-43-4] (Vol. 10, Suppl. 7; 1987)

Hydroxyurea [127-07-1] (Vol. 76; 2000)

Hypochlorite salts (Vol. 52; 1991)

Insulation glass wool (Vol. 43, Vol. 81; 2002)

Iron-dextrin complex [9004-51-7] (Vol. 2, Suppl. 7; 1987)

Iron sorbitol-citric acid complex [1338-16-5] (Vol. 2, Suppl.7; 1987)

Isatidine [15503-86-3] (Vol. 10, Suppl. 7; 1987)

Isonicotinic acid hydrazide (Isoniazid) [54-85-3] (Vol. 4, Suppl.7; 1987)

Isophosphamide [3778-73-2] (Vol. 26, Suppl. 7; 1987)

Isopropanol [67-63-0] (Vol. 15, Suppl. 7, Vol. 71; 1999)

Isopropyl oils (Vol. 15, Suppl. 7, Vol. 71; 1999)

Isosafrole [120-58-1] (Vol. 10, Suppl. 7; 1987)

Jacobine [6870-67-3] (Vol. 10, Suppl. 7; 1987)

Kaempferol [520-18-3] (Vol. 31, Suppl. 7; 1987)

Kojic acid [501-30-4] (Vol. 79; 2001)

Lauroyl peroxide [105-74-8] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Lead compounds, organic (Vol. 23, Suppl. 7, Vol. 87; in preparation)

Light Green SF [5141-20-8] (Vol. 16, Suppl. 7; 1987)

*d*-Limonene [5989-27-5] (Vol. 73; 1999)  
(NB: Overall evaluation downgraded from 2B to 3 with supporting evidence from other data relevant to carcinogenicity and its mechanisms)

Luteoskyrin [21884-44-6] (Vol. 10, Suppl. 7; 1987)

Madder root (*Rubia tinctorum*) (Vol. 82; 2002)

Magnetic fields (static) (Vol. 80; 2002)

Malathion [121-75-5] (Vol. 30, Suppl. 7; 1987)

Maleic hydrazide [123-33-1] (Vol. 4, Suppl. 7; 1987)

Malonaldehyde [542-78-9] (Vol. 36, Suppl. 7, Vol. 71; 1999)

Maneb [12427-38-2] (Vol. 12, Suppl. 7; 1987)

Mannomustine dihydrochloride [551-74-6] (Vol. 9, Suppl. 7; 1987)

Medphalan [13045-94-8] (Vol. 9, Suppl. 7; 1987)

Melamine [108-78-1] (Vol. 73; 1999)  
(NB: Overall evaluation downgraded from 2B to 3 with supporting evidence from other data relevant to carcinogenicity and its mechanisms)

6-Mercaptopurine [50-44-2] (Vol. 26, Suppl. 7; 1987)

Mercury [7439-97-6] and inorganic mercury compounds (Vol. 58; 1993)

Metabisulfites (Vol. 54; 1992)

Methimazole [60-56-0] (Vol. 79; 2001)

Methotrexate [59-05-2] (Vol. 26, Suppl. 7; 1987)

Methoxychlor [72-43-5] (Vol. 20, Suppl. 7; 1987)

Methyl acrylate [96-33-3] (Vol. 39, Suppl. 7, Vol. 71; 1999)

5-Methylangelicin [73459-03-7] plus ultraviolet A radiation (Suppl.7; 1987)

Methyl bromide [74-83-9] (Vol. 41, Suppl. 7, Vol. 71; 1999)

Methyl *tert*-butyl ether [1634-04-4] (Vol. 73; 1999)

Methyl carbamate [598-55-0] (Vol. 12, Suppl. 7; 1987)

Methyl chloride [74-87-3] (Vol. 41, Suppl. 7, Vol. 71; 1999)

1-Methylchrysene [3351-28-8] (Vol. 32, Suppl. 7; 1987)

2-Methylchrysene [3351-32-4] (Vol. 32, Suppl. 7; 1987)

3-Methylchrysene [3351-31-3] (Vol. 32, Suppl. 7; 1987)

4-Methylchrysene [3351-30-2] (Vol. 32, Suppl. 7; 1987)

6-Methylchrysene [1705-85-7] (Vol. 32, Suppl. 7; 1987)

*N*-Methyl-*N*,4-dinitrosoaniline [99-80-9] (Vol. 1, Suppl. 7; 1987)

4,4'-Methylene bis(*N,N*-dimethyl)benzenamine [101-61-1](Vol. 27, Suppl. 7; 1987)

4,4'-Methylenediphenyl diisocyanate [101-68-8] (Vol. 19, Suppl. 7, Vol. 71; 1999)

2-Methylfluoranthene [33543-31-6] (Vol. 32, Suppl. 7; 1987)

3-Methylfluoranthene [1706-01-0] (Vol. 32, Suppl. 7; 1987)

Methylglyoxal [78-98-8] (Vol. 51; 1991)

Methyl iodide [74-88-4] (Vol. 41, Suppl. 7, Vol. 71; 1999)

Methyl methacrylate [80-62-6] (Vol. 60; 1994)

*N*-Methylolacrylamide [90456-67-0] (Vol. 60; 1994)

Methyl parathion [298-00-0] (Vol. 30, Suppl. 7; 1987)

1-Methylphenanthrene [832-69-9] (Vol. 32, Suppl. 7; 1987)

7-Methylpyrido[3,4-*c*]psoralen [85878-63-3] (Vol. 40, Suppl.7; 1987)

Methyl red [493-52-7] (Vol. 8, Suppl. 7; 1987)

Methyl selenac [144-34-3] (Vol. 12, Suppl. 7; 1987)

Modacrylic fibres (Vol. 19, Suppl. 7; 1987)

Monuron [150-68-5] (Vol. 53; 1991)

Morpholine [110-91-8] (Vol. 47, Vol. 71; 1999)

Musk ambrette [83-66-9] (Vol. 65; 1996)

Musk xylene [81-15-2] (Vol. 65; 1996)

1,5-Naphthalenediamine [2243-62-1] (Vol. 27, Suppl. 7; 1987)

1,5-Naphthalene diisocyanate [3173-72-6] (Vol. 19, Suppl. 7, Vol. 71; 1999)

1-Naphthylamine [134-32-7] (Vol. 4, Suppl. 7; 1987)

1-Naphthylthiourea (ANTU) [86-88-4] (Vol. 30, Suppl. 7; 1987)

Nithiazide [139-94-6] (Vol. 31, Suppl. 7; 1987)

5-Nitro-*ortho*-anisidine [99-59-2] (Vol. 27, Suppl. 7; 1987)

9-Nitroanthracene [602-60-8] (Vol. 33, Suppl. 7; 1987)

7-Nitrobenz[*a*]anthracene [20268-51-3] (Vol. 46; 1989)

6-Nitrobenzo[*a*]pyrene [63041-90-7] (Vol. 46; 1989)

4-Nitrobiphenyl [92-93-3] (Vol. 4, Suppl. 7; 1987)

3-Nitrofluoranthene [892-21-7] (Vol. 33, Suppl. 7; 1987)

Nitrofural (Nitrofurazone) [59-87-0] (Vol. 50; 1990)

Nitrofurantoin [67-20-9] (Vol. 50; 1990)

1-Nitronaphthalene [86-57-7] (Vol. 46; 1989)

2-Nitronaphthalene [581-89-5] (Vol. 46; 1989)

3-Nitroperylene [20589-63-3] (Vol. 46; 1989)

2-Nitropyrene [789-07-1] (Vol. 46; 1989)

*N'*-Nitrosoanabasine [37620-20-5] (Vol. 37, Suppl. 7; 1987)

*N'*-Nitrosoanatabine [71267-22-6] (Vol. 37, Suppl. 7; 1987)

*N*-Nitrosodiphenylamine [86-30-6] (Vol. 27, Suppl. 7; 1987)

*para*-Nitrosodiphenylamine [156-10-5] (Vol. 27, Suppl. 7; 1987)

*N*-Nitrosofolic acid [29291-35-8] (Vol. 17, Suppl. 7; 1987)

*N*-Nitrosoguvacine [55557-01-2] (Vol. 85; in preparation)

*N*-Nitrosoguvacoline [55557-02-3] (Vol. 85; in preparation)

*N*-Nitrosohydroxyproline [30310-80-6] (Vol. 17, Suppl. 7; 1987)

3-(*N*-Nitrosomethylamino)propionaldehyde [85502-23-4] (Vol. 85; in preparation)

4-(*N*-Nitrosomethylamino)-4-(3-pyridyl)-1-butanal (NNA) [64091-90-3] (Vol. 37, Suppl. 7; 1987)

*N*-Nitrosoproline [7519-36-0] (Vol. 17, Suppl. 7; 1987)

Nitrotoluenes [88-72-2; 99-08-1; 99-99-0] (Vol. 65; 1996)

5-Nitro-*ortho*-toluidine [99-55-8] (Vol. 48; 1990)

Nitrovin [804-36-4] (Vol. 31, Suppl. 7; 1987)

Nylon 6 [25038-54-4] (Vol. 19, Suppl. 7; 1987)

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*Opisthorchis felineus* (infection with) (Vol. 61; 1994)

Orange I [523-44-4] (Vol. 8, Suppl. 7; 1987)

Orange G [1936-15-8] (Vol. 8, Suppl. 7; 1987)

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Palygorskite (attapulgite) [12174-11-7] (short fibres, < 5 micrometers) (Vol. 68; 1997)

Paracetamol (Acetaminophen) [103-90-2] (Vol. 73; 1999)

Parasorbic acid [10048-32-5] (Vol. 10, Suppl. 7; 1987)

Parathion [56-38-2] (Vol. 30, Suppl. 7; 1987)

Patulin [149-29-1] (Vol. 40, Suppl. 7; 1987)

Penicillic acid [90-65-3] (Vol. 10, Suppl. 7; 1987)

Pentachloroethane [76-01-7] (Vol. 41, Suppl. 7, Vol. 71; 1999)

Permethrin [52645-53-1] (Vol. 53; 1991)

Perylene [198-55-0] (Vol. 32, Suppl. 7; 1987)

Petasitenine [60102-37-6] (Vol. 31, Suppl. 7; 1987)

Phenanthrene [85-01-8] (Vol. 32, Suppl. 7; 1987)

Phenelzine sulfate [156-51-4] (Vol. 24, Suppl. 7; 1987)

Phenicarbazide [103-03-7] (Vol. 12, Suppl. 7; 1987)

Phenol [108-95-2] (Vol. 47, Vol. 71; 1999)

Phenylbutazone [50-33-9] (Vol. 13, Suppl. 7; 1987)

*meta*-Phenylenediamine [108-45-2] (Vol. 16, Suppl. 7; 1987)

*para*-Phenylenediamine [106-50-3] (Vol. 16, Suppl. 7; 1987)

*N*-Phenyl-2-naphthylamine [135-88-6] (Vol. 16, Suppl. 7; 1987)

*ortho*-Phenylphenol [90-43-7] (Vol. 73; 1999)

Picloram [1918-02-1] (Vol. 53; 1991)

Piperonyl butoxide [51-03-6] (Vol. 30, Suppl. 7; 1987)

Polyacrylic acid [9003-01-4] (Vol. 19, Suppl. 7; 1987)

Polychlorinated dibenzo-*para*-dioxins (other than 2,3,7,8-tetrachlorodibenzo-*para*-dioxin) (Vol. 69; 1997)

Polychlorinated dibenzofurans (Vol. 69; 1997)

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Polyvinyl chloride [9002-86-2] (Vol. 19, Suppl. 7; 1987)

Polyvinyl pyrrolidone [9003-39-8] (Vol. 19, Suppl. 7, Vol. 71; 1999)

Ponceau SX [4548-53-2] (Vol. 8, Suppl. 7; 1987)

Potassium bis(2-hydroxyethyl)dithiocarbamate [23746-34-1] (Vol.12, Suppl. 7; 1987)

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Propham [122-42-9] (Vol. 12, Suppl. 7; 1987)

*n*-Propyl carbamate [627-12-3] (Vol. 12, Suppl. 7; 1987)

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Pyridine [110-86-1] (Vol. 77; 2000)

Pyrido[3,4-*c*]psoralen [85878-62-2] (Vol. 40, Suppl. 7;1987)

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*para*-Quinone [106-51-4] (Vol. 15, Suppl. 7, Vol. 71; 1999)

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Rhodamine 6G [989-38-8] (Vol. 16, Suppl. 7; 1987)

Rifampicin [13292-46-1] (Vol. 24, Suppl. 7; 1987)

Ripazepam [26308-28-1] (Vol. 66; 1996)

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Rugulosin [23537-16-8] (Vol. 40, Suppl. 7; 1987)

Saccharated iron oxide [8047-67-4] (Vol. 2, Suppl. 7; 1987)

Saccharin [81-07-2] and its salts (Vol. 73; 1999)  
(NB: Overall evaluation downgraded from 2B to 3 with supporting evidence from other data relevant to carcinogenicity and its mechanisms)

Scarlet Red [85-83-6] (Vol. 8, Suppl. 7; 1987)

*Schistosoma mansoni* (infection with) (Vol. 61; 1994)

Selenium [7782-49-2] and selenium compounds (Vol. 9, Suppl. 7;1987)

Semicarbazide hydrochloride [563-41-7] (Vol. 12, Suppl. 7; 1987)

Seneciophylline [480-81-9] (Vol. 10, Suppl. 7; 1987)

Senkirkine [2318-18-5] (Vol. 31, Suppl. 7; 1987)

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Shikimic acid [138-59-0] (Vol. 40, Suppl. 7; 1987)

Silica [7631-86-9], amorphous (Vol. 68; 1997)

Simazine [122-34-9] (Vol. 73; 1999)

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Sodium chlorite [7758-19-2] (Vol. 52; 1991)

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Spironolactone [52-01-7] (Vol. 79; 2001)

Styrene-acrylonitrile copolymers [9003-54-7] (Vol. 19, Suppl.7; 1987)

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Sulfafurazole (Sulfisoxazole) [127-69-5] (Vol. 24, Suppl. 7; 1987)

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- Cardiac pacemakers
- Dental materials
- Ceramic materials

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Talc [14807-96-6], not containing asbestiform fibres (Vol. 42, Suppl. 7; 1987)

Tannic acid [1401-55-4] and tannins (Vol. 10, Suppl. 7; 1987)

Temazepam [846-50-4] (Vol. 66; 1996)

2,2',5,5'-Tetrachlorobenzidine [15721-02-5] (Vol. 27, Suppl. 7; 1987)

1,1,1,2-Tetrachloroethane [630-20-6] (Vol. 41, Suppl. 7, Vol. 71; 1999)

1,1,2,2-Tetrachloroethane [79-34-5] (Vol. 20, Suppl. 7, Vol. 71; 1999)

Tetrachlorvinphos [22248-79-9] (Vol. 30, Suppl. 7; 1987)

Tetrakis(hydroxymethyl)phosphonium salts (Vol. 48, Vol. 71; 1999)

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Thiourea [62-56-6] (Vol. 79; 2001)

Thiram [137-26-8] (Vol. 53; 1991)

Titanium dioxide [13463-67-7] (Vol. 47; 1989)

Toluene [108-88-3] (Vol. 47, Vol. 71; 1999)

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1,1,1-Trichloroethane [71-55-6] (Vol. 20, Suppl. 7, Vol. 71; 1999)

1,1,2-Trichloroethane [79-00-5] (Vol. 52, Vol. 71; 1999)

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Triethylene glycol diglycidyl ether [1954-28-5] (Vol. 11, Suppl. 7, Vol. 71; 1999)

Trifluralin [1582-09-8] (Vol. 53; 1991)

4,4',6-Trimethylangelicin [90370-29-9] plus ultraviolet A radiation (Suppl. 7; 1987)

2,4,5-Trimethylaniline [137-17-7] (Vol. 27, Suppl. 7; 1987)

2,4,6-Trimethylaniline [88-05-1] (Vol. 27, Suppl. 7; 1987)

4,5',8-Trimethylpsoralen [3902-71-4] (Vol. 40, Suppl. 7; 1987)

2,4,6-Trinitrotoluene [118-96-7] (Vol. 65; 1996)

Triphenylene [217-59-4] (Vol. 32, Suppl. 7; 1987)

Tris(aziridinyl)-*para*-benzoquinone (Triaziquone) [68-76-8] (Vol. 9, Suppl. 7; 1987)

Tris(1-aziridinyl)phosphine oxide [545-55-1] (Vol. 9, Suppl. 7; 1987)

2,4,6-Tris(1-aziridinyl)-*s*-triazine [51-18-3] (Vol. 9, Suppl. 7; 1987)

Tris(2-chloroethyl) phosphate [115-96-8] (Vol. 48, Vol. 71; 1999)

1,2,3-Tris(chloromethoxy)propane [38571-73-2] (Vol. 15, Suppl. 7, Vol. 71; 1999)

Tris(2-methyl-1-aziridinyl)phosphine oxide [57-39-6] (Vol. 9, Suppl. 7; 1987)

Vat Yellow 4 [128-66-5] (Vol. 48; 1990)

Vinblastine sulfate [143-67-9] (Vol. 26, Suppl. 7; 1987)

Vincristine sulfate [2068-78-2] (Vol. 26, Suppl. 7; 1987)

Vinyl chloride-vinyl acetate copolymers [9003-22-9] (Vol. 19, Suppl. 7; 1987)

Vinylidene chloride [75-35-4] (Vol. 39, Suppl. 7, Vol. 71; 1999)

Vinylidene chloride-vinyl chloride copolymers [9011-06-7] (Vol.19, Suppl. 7; 1987)

Vinylidene fluoride [75-38-7] (Vol. 39, Suppl. 7, Vol. 71; 1999)

*N*-Vinyl-2-pyrrolidone [88-12-0] (Vol. 19, Suppl. 7, Vol. 71; 1999)

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Vitamin K [12001-79-5] substances (Vol. 76; 2000)

Wollastonite [13983-17-0] (Vol. 68; 1997)

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2,4-Xylidine [95-68-1] (Vol. 16, Suppl. 7; 1987)

2,5-Xylidine [95-78-3] (Vol. 16, Suppl. 7; 1987)

Yellow AB [85-84-7] (Vol. 8, Suppl. 7; 1987)

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Zectran [315-18-4] (Vol. 12, Suppl. 7; 1987)

Zeolites [1318-02-1] other than erionite (clinoptilolite, phillipsite, mordenite, non-fibrous Japanese zeolite, synthetic zeolites) (Vol.68; 1997)

Zineb [12122-67-7] (Vol. 12, Suppl. 7; 1987)

Ziram [137-30-4] (Vol. 53; 1991)

### **Mixtures**

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Diesel fuels, distillate (light) (Vol. 45; 1989)

Fuel oils, distillate (light) (Vol. 45; 1989)

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Mate (Vol. 51; 1991)

Mineral oils, highly-refined (Vol. 33, Suppl. 7; 1987)

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Tea (Vol. 51; 1991)

Terpene polychlorinates (Strobane<sup>®</sup>) [8001-50-1] (Vol. 5, Suppl. 7; 1987)

### **Exposure circumstances**

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Hair colouring products (personal use of) (Vol. 57; 1993)

Leather goods manufacture (Vol. 25, Suppl. 7; 1987)

Leather tanning and processing (Vol. 25, Suppl. 7; 1987)

Lumber and sawmill industries (including logging) (Vol. 25, Suppl.7; 1987)

Paint manufacture (occupational exposure in) (Vol. 47; 1989)

Pulp and paper manufacture (Vol. 25, Suppl. 7; 1987)

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**Group 4: Probably not carcinogenic to humans (1)**

Caprolactam [105-60-2] (Vol. 39, Suppl. 7, Vol. 71; 1999)