Absorption, 13, 21, 638 Acceptable daily intake (ADI), 155-156, 162 Accumulation particle mode, 5 Acidic aerosols, 958 Acrolein, 205-240 Acrylamide, 189-190 Acute lung injury, 232-233 Adverse health effects, 25 Adverse outcomes pathway, 58 Aerodynamic diameter, 3, 4, 391–392, 395-397, 399-403, 405-430, 436-440 Aerosol dispersion, 805 Aerosols, 2, 5 Aflatoxin, 186 Agency for Toxic Substances and Disease Registry (ATSDR), 113 Ah receptor, 175-176 Airborne acidity, 988 Air contaminants, 2 Airway hyerreactivity (hyperresponsiveness), 574, 578, 800, 806, 820, 988 Airway inflammation, 801, 817 Airway permeability, 800, 817 Aitken or condensation nuclei, 5 Alpha particles, 877 Alveolar macrophages, 398, 400-404, 407-409 Alveolus, 13

Ambient air, 960 Amosite fibers, 390 Amphibole fibers, 390, 419–421 Anemia, 376, 459, 567 Anthophyllite fibers, 390, 399, 406, 408, 410, 411, 414, 425, 428 Arsenic, 173–174, 178, 270–273, 304, 367, 541 Arsines, 270–273, 377 Asbestiform nature (fibers), 389–390 Asbestos, 389–439, 997 Asbestosis, 403–407, 414, 416–417 Asthma, 236–237, 591, 737, 953 Athletic performance, 816 Azaspiracids (AZA), 187–188

Benchmark reference dose (RfD), 47 Beta particles, 877 Bioavailability, 372 Biogeochemical cycling, 631 Biological mechanisms, 989 Biological plausibility, 331 Biomarkers (biological markers), 207, 648, 915 Biomonitoring, 133 Biomonitoring Equivalents (BEs), 134 Bisphenol A (BPA), 537–541, 544, 546 Bladder cancer risk, 49 Bromine, 265–266

Environmental Toxicants: Human Exposures and Their Health Effects, Fourth Edition.

()

()

Edited by Morton Lippmann and George D. Leikauf.

 $[\]ensuremath{\mathbb C}$ 2020 John Wiley & Sons, Inc. Published 2020 by John Wiley & Sons, Inc.

Bronchiole, 13 Bronchoconstrictive effects, 932 Bronchus, 13 Cadmium, 172, 178 Caffeine, 182–183 Cancer, 410-415, 958 Cancer risk, 49, 158-160, 410-415, 888 Carbon monoxide, 455-473 Carbon nanotubes, 392-393, 703 Carcinogenesis, 580 Carcinogenicity, 402, 405-410, 498-500, 595,746 Cardiovascular effects, 108, 239, 299-301, 303-305, 308-310, 323-324, 333-337, 346-348, 378, 461, 463-470, 472, 693, 700 Chemical contaminants, 2 Childhood asthma, 236–237, 304, 312 Childhood smoking, 900 Chloramphenicol, 171 Chlorine, 265 Chromium, 304, 487-503 Chronic bronchitis, 235-236, 494, 953-954 Chronic exposures, 827 Chronic lung disease, 828 Chronic obstructive pulmonary disease (COPD), 235-236, 378, 469-470, 495 Chrysotile fibers, 390, 405-415 Cigarette smoke, 206, 490 Clearance, 9 Cleavage fragments, 390, 425 Clenbuterol, 171 Climate change health effects, 111 Clinical approaches, 92-94 Clinical signs, 137 Coal smoke, 293, 298 Coarse particle mode, 5, 287-289 Coherence, 337–352 Cohort studies, 526 Color additives, 156, 169 Complex diseases, 31 Comprehensive Environmental Response, Compensation, and Liability Act, 75 Concentrated ambient PM (CAPs), 325-332, 335-337 Concentration units, 2 Concepts of exposure, 88 Condensation nuclei (CN), 5 Control in vitro exposures, 36, 400 Controlled human exposures, 32, 98–99, 325-326, 465-470, 738, 746 Controlled laboratory animal exposures, 36

Coronary artery calcium, 737 Coronary heart disease, 316 Corrective action, 76 Counseling of patients, 112 Critical fiber dimensions, 399, 407-416, 422, 434 Critical fiber parameters, 407-416 Critical fiber properties, 399, 407-416, 422, 434 Crocidolite fibers, 390-391, 394, 396-397, 399-402, 405-414, 416, 418-421, 424-428, 430-433 Crotonaldehyde, 205, 230 Curie, 904 Cyanide, 179-180, 182, 274 Cyanogenic Glycosides, 179-180 Cyanotoxins, 187-189 Defense mechanisms, 579 Delaney Amendment, 158-160 Deoxynivalenol (DON), 186-187 Deposition, 9, 13, 15 Dermal effects see Skin effects Developmental origins of health and disease (DOHaD), 536 Dibenzofurans (CDFs), 175 Diesel engine exhaust (DEP), 333, 515-529 Dietary supplements, 151 Diethylstilbestrol (DES), 171, 538 Diffusion, 395 Dimetridazole, 171 Dioxins, 175-176, 543, 977 Disease pathogenesis, 31 Disinfection, 632 Disintegration, 397 Disposition, 4, 128 Dissolution, 397 Dissolved contaminants, water, 6 Dissolved gases, water contaminants, 6 Dissolved solids, water contaminants, 6 Distribution, 428 DNA-Protein Cross-Links, 589 Dose, 9, 29, 47 Dose-response analysis, 47 Dose-response relationship, 28, 69 Dosimetric models, 22, 895 Dosimetry, 7, 436, 456-457, 561, 725, 754, 756, 932, 978-979 Drinking water disinfection, 632 Dust, 4 Dustfall, 6

Electronic nicotine delivery systems (ENDS), 111 Electrostatic precipitation, 395

()

1/31/2020 3:50:04 PM

Elimination, 434-435, 684 Emergency department visits, 827 Emission standards, 55, 759 Endocrine activity, 135 Endocrine-disrupting chemicals (EDCs), 535 Endocrine/reproductive toxicity, 535 Engineering/installation/design/controls, 455 Environmental contamination, 154 Environmental exposure, 515, 679 Environmental lung disease, 92 Environmental tobacco smoke (ETS), 239 Epidemiological approaches, 103 Epidemiological studies, 107-108 Epidemiology, 726 Epigenetic, 540-542 Erionite fibers, 392, 407, 413-414, 424-427, 430, 433, 437, 440 Estimated daily intake, 161 Excretion, 640 Exposure assessment, 48, 69, 916 Exposure guidelines, 833 Exposure limits, 132 Exposure receptors, 88 Exposure-response relationships, 26, 790-796 Exposures, 7, 8,9, 88, 131, 679, 681, 682, 753, 929 Exposures to radiation workers, 877 Exposure stressors, 88 Exposure surrogates, 9 Extrapulmonary effects, 746 Fetal effects, 460, 471, 497, 544 Fiber deposition, 395–397 Fiber diameter, 391-392, 395-397, 399-403, 405-430, 436-440 Fiber dissolution, 397-403 Fiber dosimetry, 436–438 Fiber length, 391-440 Fibrogenesis, 425 Fine particulate matter, 287-289, 313-316 Fog, 4 Food additives, 156-158 Food color additives, 169-170 Food contact materials, 167-168 Food contaminants, 7, 151, 371-372, 489 Food, Drug, and Cosmetic Act (FDCA), 152-153 Food-related health risks, 150 Food Safety Modernization Act (FSMA), 153 - 155Fullerenes, 701 Fume, 4

Fumonisin, 186 Gases and vapors, 2 Gastrointestinal absorption, 634 Gastrointestinal tract effects, 495 Gene-lifestyle-environment interactions, 31 Generally recognized as safe (GRAS) substances, 151-152, 164-166 Genomics, 31, 99 Genotoxicity, 821 Good laboratory practices (GLP), 137 Groundwater, 369-372, 488 Ground water measurements, 885 Guidelines, 897 Halogenated oximes, 266 Hazard control strategies, 129 Hazard identification, 46, 69 Haze, 5 Health, 24 Health effects epidemiology, 726 Health surveillance, 102 Hepatic effects, 495-496 Herbicides, 135, 863 Hormesis, 48 Human genome, 30 Hydrogen sulfide (H₂S), 274–275 Immune responses, 232-234, 497, 893 Impaction, 395-396 Individual susceptibility, 29, 99 Indoor radon measurements, 891 Industrial hygiene, 131 Infant mortality, 308 Inflammation, 232 Ingestion, 19 Inhalation, 13 Inorganic food contaminants, 171-175 Insecticides, 860 Instillation, 400-401, 405, 409 Interception, 395–396 Intervention, 937 Intraperitoneal injection, 401-403, 405, 407, 411, 428, 436 In vitro toxicology, 36

Fumigants, 866

Kinetically derived maximum dose (KMD), 136 Kinetics, 642

Lead, 171–172 Leukemia, 43, 580

()

1/31/2020 3:50:04 PM

Lewisite, 270–271 Life cycle of a chemical, 128 Lifespan shortening, 828 Light scatter, 6 Longevity, 829 Lowest observable adverse effect level (LOAEL), 47 Lung cancer risk, 375, 498, 515, 521–529, 877, 888, 890 Lung dosimetry, 892 Lung infectivity, 820 Lung structure, 828

 $(\mathbf{ })$

Management systems verification, 144 Man-made vitreous fibers (MMVF), 391, 401, 405-406, 411 Mass concentration, aerosol, 5 Mass median aerodynamic diameter (MMAD), 3,4 Material safety data sheet (MSDS), 130 Maximum contaminant levels (MCLs), 77 Maximum tolerated dose (MTD), 136 Mechanisms of toxicity, 458, 500-503, 658 Mesothelioma, 392-393, 402-411 Metabolism, 228-230, 373-374, 492-494 Metabonomics, 32 Methylmercury, 172-173, 178 Microenvironments, 9 Mineralogy, 389 Mist, 4 Mode of action (MOA), 138, 158, 160-161, 212-227 Morbidity, 24, 286, 298-301, 323-325, 811, 934, 940 Mortality, 25, 286, 293-301, 808, 934 Mucociliary particle clearance, 398, 438, 576, 579, 954, 980 Mucociliary transport Multiple chemical sensitivity Mutagenicity, 595 Mycotoxins, 186-187

Nanoparticles (NP), 5, 392–393, 696, 706 Nano *see* nanoparticles Nasopharynx, 13 National Health and Nutrition Examination Survey (NHANES), 89 Naturally occurring radioactive material (NORM) Nature of risk Nematocides Neoplastic effects Nerve agents, 262-265 Nervous system effects, 237-238, 461, 470-471,805 Neurotoxic effects, 237-238, 316-317, 379-380, 652 New dietary ingredients (NDIs), 191 Nickel, 175, 178, 304, 307 Nitrates, 185-186 Nitrosamines, 189-192 Non-monotonic dose-response (NMDR), 539 No observable adverse effect level (NOAEL), 47, 137, 155 Nuclear fuel cycle Nuclear weapons complex Number concentration, aerosol, 5 Nutrients, 151

Occupational exposure Occupational exposure limits (OELs), 132 Occupation health Ochratoxin (OTA), 186–187 Okadaic acid (OA),, 187–189 Organophosphates, 262–265, 856 Outdoor ambient air exposures, 12 Outdoor radon measurement, 892 Oxalate, 181 Ozone dosimetry, 788

Panel studies, 940 Particle characteristics, 3 Particle clearance, 15, 21, 804, 819, 944, 948 Particle deposition in respiratory tract, 15-18 Particle size distribution, 2 Particulate matter (PM), 285-353, 976 Partition coefficients, 81 Parts per billion (ppb), 2 Parts per million (ppm), 2 Pathogenesis of chronic bronchitis, 235-236 Pathways for human exposure, 290-291 PCBs and congeners, 175 Pediatric exposures Perchlorates, 174, 178 Perfluorinated compounds, 176-178 Perfluorooctonate (PFOA), 176-178 Pesticides, 184-185, 543, 855 Pharmacokinetics Phosgene, 266 Phosphine, 271-272 Photochemical Air Pollution, 783 Phthalates, 540, 542-544 Phycotoxins, 187-189 Phytohemagglutinin (PHA), 183

()

PM₂₅, 286 PM₁₀, 286 Polybrominated diphenyl ethers (PBDEs), 176, 542 Polychlorinated biphenyls (PCBs), 175-176, 178, 543, 977 Polychlorinated dibenzo-P-dioxin (CDDs), 168-169, 176-178 Poly halogenated aromatic hydrocarbons (PHAHs), 459-460, 789 Pregnancy outcomes, 460, 464-465 Prevention, 688 Primordial decay series, 878-879 Probability of effect, 42 Product stewardship, 138-142 Proportional hazard index (HI), 47 Proteomics, 31 Psychosocial and cultural factors of perceived risk, 44 Pulmonary artery, 13 Pulmonary function testing, 96 Pulmonary vein, 13

()

Risk factor, 44

Quantum dots, 706

()

Radionuclides, 877 Radon, 877 Radon and smoking, 899 Radon decay measurements, 884 Radon dosimetry, 896 Radon Epidemiology, 888 Reference concentration (RfC), 134, 155 Reference dose (RfD), 47, 134 Refractory ceramic fibers (RCFs), 387, 391, 400, 405-407, 412, 423-425, 427-428, 430, 437, 439 Renal effects, 238, 496 Reproductive toxicity, 746 Residential exposures, 11 Respiratory function, 424, 573, 790, 827, 945-646 Respiratory mechanics, 571–572 Respiratory tract biochemistry, 744 Respiratory tract structure, 13, 409, 742 Responsible care, 142-144 Responsiveness, 29 Retention, 9, 13 Risk assessment, 67, 74, 430-435 Risk-based screening levels (RBSL), 77 Risk based corrective action (RBCA), 76 Risk characterization, 48, 69 Risk communication, 51

Risk management, 46, 48, 56, 69, 75 Risk reduction, 56, 65 Rodenticides, 271-273, 865 Saccharin, 51 Saxitoxins, 187-189 Second-hand tobacco smoke (SHS), 235, 911 Sedimentation, 395-396 Severity of effect, 43 Short-term exposure limit (STEL), 132 Sick building syndrome Silica, 708 Silver, 708 Site-specific target levels (SSTLs), 77 Size-selective particulate matter sampling, 979 Skin cancer, 375 Skin damage, 377, 496 Skin effects, 7 Skin exposure, 20, 231, 373, 490-491 Smog, 4 Smoke, 4 Solanine, 182-184 Sorption/desorption kinetics, 79 Sources, 556, 928 Standards, 833, 960 Standards development Submicrometer aerosol, 5 Sulfur mustard, 266-270 Superfund, 73-76 Surface concentration, aerosol, 5 Susceptibility, 29 Suspended particles, water contaminants, 6 Symptomatic responses, 578, 798 Synthetic vitreous fibers (SVF), 391-393, 400-403, 405-406, 412, 415, 421-425, 427-430, 434-435 Systemic effects, 21 Target tissues, 9 Terminal bronchiole, 13 Testicular dysgenesis syndrome (TDS), 545 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), 175-176, 178, 543-544 Tetramethylenedisulfotetramine (TMDT), 272 - 273Tetrodotoxin (TTX), 180 Thorium-232, 877 Thoron, 887 Threshold limit value (TLV), 132 Time weighted average (TWA), 132 Tobacco smoke, 230, 235. 911

1/31/2020 3:50:04 PM

()

Tolerable daily intake (TDI), 156, 162, 175 Total suspended particulate matter (TSP), 298, 301 Trachea, 13 Transcriptomics, 31 Translocation, 397–398, 403, 409, 643 Treatment, 661 Treatment of uncertainty, 53 Tremolite fibers, 390

Ultrafine particles (UFP), 5, 695–696, 706 Uranium-238 Uranium-235, 877 Vesicants, 266–271 Vinyl chloride, 168 Volatile organic compounds (VOCs), 977

۲

Water contaminants, 6 Working level (WL), 894 Workplace exposures, 10 World Health Organization (WHO) Guidelines, 960 World Trade Center (WTC), 434, 973

۲

۲