

# Index

## A

Acetone, 13, 21, 58, 101  
Acetonitrile, 79, 85  
Acrolein, 60  
Actinolite, 56  
Activated carbon fiber, 100  
Adhesives, 11, 15, 23, 72, 91, 118, 148–150, 166  
Adipates, 24, 26  
Adipinic acid, 23  
Adsorption, 100  
Agriculture, 72  
    burnings, 64  
    residues, 125, 136  
Air cleaners, maintenance, 166  
Air-conditioning, 4, 94, 147, 160  
Aircraft cabins, 74  
Air exchange, 3  
Air fresheners, 18, 19, 71, 72  
Air velocity, 5, 11, 16, 161  
Alcohols, 17, 71, 83, 91  
Aldehydes, 13, 18, 60, 71–77, 83, 85, 88, 96, 97  
Alkanes, 13, 26, 58, 65, 78  
Alkenes, 71, 75, 83, 91, 96  
Alkyd resins, 18, 159  
Allergens, 19, 49, 56  
Allergy/allergic diseases, 111, 116, 119, 153  
Aluminium silicate, 57  
Amines, 71, 79, 83  
Ammonia, 158–161, 165  
Ammonium, 48, 64  
Amosite, 56  
Anemometers, 8  
Animal buildings, 74  
Animal dander/dandruff, 49, 55, 152

Animal dung, 63, 125, 138  
Anthophyllite, 56  
Antiperspirants, 88  
Antirust coatings, 159  
Arsenic, 48, 128  
Asbestos, 37, 48, 56

## B

Bacteria, 46, 49, 72, 99, 152–162  
Bake-out, 100  
Barbershops, 158  
Benzaldehyde, 21, 87, 101  
Benzene, 58, 83–99, 149, 150, 158–161, 165  
Benzene, toluene, and xylenes (BTX), 149  
Benzo[a]pyrene, 58, 65, 128, 136, 158, 161  
Bioaerosols, 37, 49, 152  
Biodiesel, 65  
Biogas, 137  
Biological aerosol particles (BAP), 49  
Biological treatment, 99  
Biomarkers, 131  
Biomass, 125–138, 146  
    burning, 57, 63  
    fuels, 125  
Bis(2-ethylhexyl) adipate, 26  
Bis(2-ethylhexyl) decanedioate, 26  
Bisphenol A, 109, 113, 115, 116  
Bookstores, 158  
Bromine, 57, 156  
Building materials/products, 1–22, 112, 119, 158–165  
Building recirculation rates (BRR), 100  
Building-related illness (BRI), 97  
Burden of disease, 125

- Butadiene, 22  
 1,4-Butanediol, 23  
*n*-Butanol, 17  
 2-Butoxyethoxyethanol, 96, 97  
 Butyl acetate, 17, 96  
 Butylacrylate, 17  
 Butyl benzyl phthalate (BBzP), 118, 120
- C**
- Calcium, 48, 57  
 Candle flames, 46, 57, 72  
 Carbon black, 13, 76  
 Carbon dioxide, 3, 12, 57, 157, 161  
 Carbon disulphide/carbon disulfide, 23, 79, 85  
 Carbon monoxide, 12, 60, 97, 128, 134, 157, 161  
 Carbon nanotubes, 100  
 Carboxylic acids, 23, 49, 71  
 3-Carene, 19  
 Carpets, 22, 56, 89, 91, 116, 149, 166  
 $\beta$ -Caryophyllene, 19  
 Ceramic fibers, 57  
 Charbroiling, 46, 57, 64  
 Charcoal, 13, 63, 76–82, 125  
 Children, 3, 52, 58, 109, 111, 126, 137  
   development, 24  
   low-income countries, 114  
 China, 83, 85, 127, 131–138, 145–167  
 2-Chloro-1,3-butadiene, 22  
 1-Chloro-4-(1-chlorovinyl)-cyclohexene, 22  
 1-Chloro-5-(1-chlorovinyl)-cyclohexene, 23  
 Chromium, 57, 60  
 Chronic disorders, 109–112  
 Chrysene, 65  
 Cigarettes/tobacco, 37, 43, 57–61, 72, 97, 128, 134–137, 146  
 Classrooms, 158  
 Cleaning activities, 38  
 Cleaning agents, 19, 56, 72  
 Clothes, 116  
 Coal, 57, 63, 125–137, 146, 151, 157, 162  
 Combustion products, 37–65, 135, 146  
 Compressed natural gas (CNG), 64  
 Condensation particle counters (CPCs), 17  
 Consumer products, 109  
 Cooking, 38–41, 45, 57, 63, 72, 93, 125–138, 146, 152, 156  
 Cooking fuel/cookfuel, 125  
   smoke, 127  
 Cookware, 113  
 Cork products, 19  
 Cosmetics, 19, 88, 112, 116, 119
- Cotinine, 60  
 Crocidolite (blue asbestos), 56  
 Cycloalkanes, 71, 83  
 Cycloalkenes, 71  
 Cyclohexanone, 17, 21  
 Cyclopentasiloxane, 88
- D**
- Decabromodiphenyl ether (DecaBDE), 156  
 Decanal, 18  
 Decorations, 145–150, 158–166  
 Deposition rate, 51  
 Developing countries, 41, 63, 125–131, 139  
 $\rho$ -Dichlorobenzene, 158  
 1,1-Diethoxy-cyclohexane, 17  
 Diethylamine, 23  
 Diethylstilbestrol (DES), 116  
 Diffusive interactions, 95  
 Di-*iso*-butyl phthalate (DiBP), 118  
 Diisononyl cyclohexane-1,2-dicarboxylate (DINCH), 24  
 Diisononyl phthalate (DINP), 24, 116, 118  
 1,1-Dimethoxy-cyclohexane, 17  
 Dimethylaminoethanol, 23  
 2,3-Dimethyl-2,3-butanediol (pinacol), 21  
 Dimethylformamide (DMF), 23  
 3,5-Dimethyl-1-hexyne-3-ol, 17  
 Di-*n*-butyl phthalate (DnBP), 118  
 Dining rooms, 158  
 Dinitrogen oxide, 12  
 Dinitrophenylhydrazine (DNPH), 13, 77  
 1,6-Dioxacyclododecane-7,12-dione, 23  
 Di(2-ethylhexyl) phthalate (DEHP), 24, 116  
 Disability-adjusted life years (DALY), 109  
 Diterpenoids, 63  
 Dust, 1, 4, 14, 37–57, 152, 162  
 Dust mites, 152  
 Dynamic botanic air filtration system (DBAF), 99
- E**
- Early life sensitivity, 116  
 Electrical devices, 1  
 Electron capture detector (ECDs), 80  
 Emission rates, 1, 9, 18, 24, 39, 54, 84, 93, 100  
 Emissions, secondary, 21  
 Emission test cells, 5  
 Emission test chambers, 5–8, 26  
 Emission testing, 1  
 Endocrine disrupting chemicals (EDCs), 109–117

- Environmental tobacco smoke (ETS), 37, 58–60, 97, 146
- Esters, 17, 23, 26, 71, 72, 83, 96
- Estrogens, 116
- Ethanol, 17, 65, 101, 137
- 3-Ethenylpyridine (3-EP), 60, 61
- 2-Ethoxyethanol, 96, 97
- Ethylbenzene, 94
- Exhibitions, 158
- Exposure, reconstruction, 129
- Extracellular polysaccharides, 56
- F**
- Fast mobility particle sizing (FMPS), 15
- Fatty acids, unsaturated, 18
- Fibers, 37–65, 78
- Field and laboratory emission cell (FLEC), 7
- Filtration, 52, 61, 64, 99, 134
- Flame ionization detector (FID), 12, 80
- Flame retardants, 20, 24, 49, 113, 156, 167
- Floor wax, 116
- Fluorine, 128
- Formaldehyde, 4, 13, 21, 58, 72, 74, 77–81, 86–89, 96, 99, 100, 128, 145–150, 157–161, 165
- Formic acid, 19, 23, 101
- Freon 11, 71
- Frying, 39, 45, 46, 146
- Fuel wood, 63, 138
- Fungi, 46, 49, 101, 152–155, 162
- Furfural (2-furancarboxaldehyde), 19
- Furnishings, 16, 38, 71, 89, 93
- G**
- Gas burners, 39, 45
- Gasoline, 64, 65
- Gas ovens, 39, 45
- Glucans, 56
- Glycols, 17
- Guaiaicol, 64
- Gymnasiums, 158
- H**
- Heating, ventilation, and air-conditioning (HVAC) systems, 152
- Hemicelluloses, 19
- 2,4-Heptadienal, 18
- Heptanal, 18, 19
- Hexanal, 18, 19
- Hexane, 86
- High-performance liquid chromatography (HPLC), 80
- Homes for the elderly, 158
- Hormones, 113
- Hospitals, 112, 158
- Hotels, 158
- House dust, 46, 55, 56, 152
- Household air pollution, 125
- Humidity, 5
- HVAC systems, 72
- Hydrazones, 77
- Hydrocarbons, 12, 49, 65, 131, 136
- 1-Hydroxy-cyclohexyl-phenone (HCPK), 21
- 1-Hydroxy-1-ethoxy-cyclohexane, 17
- Hydroxyl radicals, 53
- Hydroxymethylfurfural, 19
- I**
- Indoor air quality (IAQ), 145
- Indoor chemical exposure, 109
- Indoor particles, 37
- Infiltration factor, 55
- Influenza, 153
- K**
- Ketones, 13, 17, 71, 72, 77, 83, 96, 101
- Kindergartens, 158
- Kitchens, 63, 91, 126, 129
- L**
- Lacquers, 19
- Laser printers, 26, 38
- Lead (Pb), 48, 57, 65, 128
- Leakage, 112
- Legionnaires' disease, 153
- Levoglucozan, 131
- Libraries, 158
- Ligmens, 63
- Lignin, 63, 64
- Limonene, 19
- Linoleic acid, 18
- Linolenic acid, 18
- Linoleum, 18, 20
- Liquid petroleum gas (LPG), 65
- Living room, 91, 94
- Loading factor, 5–7, 16
- Longifolene, 19
- Lubricating oil, 65

**M**

Man-made mineral fibers (MMMF), 56  
 Mass spectrometry (MS), 74, 80, 82  
 Mass transfer, 10  
 Mercury, 48, 128  
 Mesothelioma, 57  
 Metal-organic frameworks, 100  
 Methanol, 17, 101  
 Methoxyphenols (MPs), 131  
 1-Methoxy-2-propanol, 96, 97  
 2-Methyl-1,3-butadiene (isoprene), 19  
 2-Methyl-butane, 19  
 4-Methyl-2-pentanone (MIBK), 17  
 Micro chamber ( $\mu$ -CTE), 7  
 Mineral wool, 56  
 Mosquito coils, 46  
 Moth balls, 94  
 Moulds (fungi), 49, 72  
 Multiple chemical sensitivity (MCS) syndrome, 97  
 Multivariate data analysis, 90  
 Myosmine, 71

**N**

Nicotine, 20, 58, 60, 61, 71, 97  
 Nitrated polycyclic aromatic hydrocarbon (nitro-PAH), 65  
 Nitrates, 42, 48, 64  
 3-Nitrobenzanthrone, 65  
 Nitrocellulose, 159  
 Nitrogen dioxide, 21, 128, 135, 161  
 Nitrogen oxides (NOx), 13, 58, 60, 158  
 Nitrosamines, 60  
*N*-Nitrosodiethylamine, 23  
 Nonanal, 19  
 Noncommunicable disease (NCD), 111  
 Nondispersive infrared spectroscopy (NDIR), 12  
 Nonstick cookware, 113  
 Norrish reactions, 21  
 Nucleation, 37, 39, 42, 43

**O**

Octanal, 19  
 Offices, 83, 85, 88, 112, 113  
   air-conditioning, 94  
   buildings, 4, 52, 158, 160  
   cleaning, 39, 56  
   dust, 55  
   equipment, 71, 72, 96  
 Oils, 18, 19, 26, 65  
 Oleic acid, 18  
 Online monitoring, 11

Oriented strand boards (OSB), 22  
 Ozone, 12, 19, 20, 26, 53, 72, 76, 95, 100, 158

**P**

Paints, 15, 19–23, 71, 89, 118  
   strippers, 71  
 PAN (peroxyacetyl nitrate), 101  
 Panels, 158  
 Particles, 1, 14, 25, 41  
   equivalent diameter, 43  
   shape, 43  
   size, 41–46, 51–54, 57, 63  
   size distribution, 45  
 Particulate matter, 1, 145  
 Particulate organic matter (POM), 71  
 Passive air sampling, 77  
 Penetration factor, 50, 54  
 Pentanal, 19  
 Perfluorinated chemicals (PFCs), 116  
 Perfluorooctane sulfonate (PFOS), 116  
 Perfluorooctanoic acid (PFOA), 116  
 Persistency, 109, 116  
 Personal care products, 72, 88, 118  
 Pesticides, 49, 156, 157  
 Pets, 38, 152  
 Phenol, 58  
 Phenolic compounds, 63, 128  
 4-Phenylcyclohexene, 22  
 Phenylene oxide, 13  
 1-Phenyl-2-hydroxy-2-methyl-propane-1-one (PHMP), 21  
 1-Phenyl-2-methyl-1,2-propane, 21  
 Phosphates, 48, 156  
 Photoacoustic spectroscopy (pas), 12  
 Photocatalytic oxidation, 100  
 Photocopiers, 38, 72, 93, 96  
 Photoinitiators, 21  
 Photoionization detector (PID), 12  
 Phthalates, 13, 24, 49, 88, 109, 156  
 Phthalic acid, 24  
 Phytosterols, 63  
 2-Picoline, 71  
 $\alpha$ -/ $\beta$ -Pinene, 19  
 Plasticizers, 24  
 Plywood, 72, 94, 148  
 Pneumonia, viral/bacterial, 153  
 Pollen, 46  
 Polychlorinated biphenyls (PCBs), 13  
 Polycyclic aromatic hydrocarbons (PAHs), 49, 58  
 Polyurethane, 159  
 Polyvinyl chloride (PVC), 20, 24, 25, 113, 116–120  
 Porous clay heterostructures (PCH), 100

Potassium, 48, 60  
Propane, 12, 46, 57  
Proton-transfer-reaction mass spectrometry (PTR-MS), 12  
Public places of entertainment, 158  
Purification, 69  
Pyrene, 65, 128  
Pyridine, 60

## R

Radionuclides, 160  
Radon, 158–161, 165  
Refurbishment, 147–150, 158, 164  
Regulations, 69, 88, 145  
Residential houses, 158  
Resuspension, 40, 42, 51  
Retene, 63

## S

Sampling, 69, 81  
Scanning mobility particle sizing (SMPS), 15  
Semi-volatile organic compounds (SVOCs), 1, 4, 14, 24, 71, 145  
Severe acute respiratory syndrome (SARS), 153  
Shopping centers, 158  
Sick building syndrome (SBS), 16, 73, 97, 147  
Silica, 128  
Silicone oils, 26  
Sink effects, 7–9, 16, 93  
Smoke, biomass, 64, 134, 135  
  cookfuel, 127, 131, 134  
  tobacco/cigarettes, 37, 39, 43, 57–61, 72, 97, 128, 134–137, 146  
  wood, 37, 64, 128  
Sodium, 44, 48, 57  
Solanesol, 60  
Solid-phase microextraction, 77  
Solvents, 17, 21, 71, 88, 149, 150  
Soot, 42, 49, 56, 64, 65  
Specific emission rate (SER), 9  
*Streptococcus hemolyticus*, 158  
Styrene–butadiene rubber (SBR), 22, 23  
Sulphates/sulfates, 42, 48, 64, 65  
Sulphur dioxide/sulfur dioxide, 128, 134  
Sulphur hexafluoride/sulfur hexafluoride, 12

## T

Tenax TA, 13, 21, 76–78, 83–86  
Terpenes, 19, 26, 52, 71, 75, 83, 95

Test chambers, 1–28  
Tetrachloroethene, 83, 91  
Tetrachloroethylene, 87, 88  
Tetramethyl-5-decyne-4,7-diol (T4MDD), 17  
Thalidomide, 116  
Toasters, 45  
Tobacco smoke, 37, 43, 57–61, 72, 97, 128, 134–137, 146  
Toluene, 53, 58, 74, 80–87, 91–101, 145, 149, 150, 158, 161  
Total suspended particulates (TSP), 14, 42  
Total volatile organic compounds (TVOCs), 12, 74, 84, 86, 94–101, 149, 158, 165  
Toys, 24, 112, 116, 119, 120  
Tremolite, 56  
Trichlorobenzene (TCB), 8  
Triethylene glycol, 100  
TXIB (2,2,4-trimethyl-1,3-pentadiol-butyrates), 92

## U

Ultrafine particles (UFPs), 15

## V

Vegetation burning, 63  
Vehicle emissions, 37, 43, 57, 64, 151  
Ventilation, 3, 52  
Very volatile organic compounds (VVOCs), 4, 71  
4-Vinylcyclohexene, 22  
Viruses, 46, 49, 152  
Volatile organic compounds (VOCs), 1, 4, 69–102, 147

## W

Waiting rooms, 158  
Whole-air sampling, 75, 78  
Wood, 19, 21, 57, 63, 125, 136, 148  
  smoke, 37, 64, 128

## X

Xylenes, 83–86, 91, 96, 99, 145, 149, 150, 158, 161, 167

## Z

Zirconium oxide, 57  
Zn-diethylthiocarbamate (ZDEC), 23