

## General Index

- 1068, 113  
1080, 783–807  
27311, 130  
38023, 281
- A**
- AC 38023, 281  
Acanthite, 765  
Aceanthrylene, 648  
Acenaphthalene, 664  
Acenaphthanthracene, 667  
Acetamide, 795  
Acetate, 379, 449, 793, 794  
Acetazolamide, 850  
Acetone, 4, 263, 280, 289, 295, 446, 576, 617, 789  
Acetone cyanohydrin, 226  
Acetonitrile, 226, 617  
Acetylaminofluorene, 664  
Acetylcholine, 234, 236, 300  
Acetylcholinesterase (Ache), 102, 104, 106, 107, 131, 132, 134, 136, 234, 235, 237, 239, 240, 377, 582  
N-Acetylcysteine, 6, 577, 793  
N-Acetyl-D-glucosamine, 252  
N-Acetylglucosamine, 247, 252  
Acid copper chromate, 155  
Acid-fast-staining intranuclear inclusion bodies, 387  
Acid mine drainage, 341, 351, 352, 367  
Acid phosphatase, 104, 845, 859, 869  
Acid volatile sulfide (AVS), 165, 765, 773  
Aconitase, 783, 792, 793  
Aconitase hydratase, 795, 798, 799  
Acquired Immune Deficiency Syndrome (AIDS), 346, 348  
Acridine, 660, 671  
Acrodermatitis enterohepatica, 862  
Acrolein, 1–15  
  carcinogenicity, 11, 14  
  chemical properties, 4, 5  
  concentrations in  
    abiotic materials, 1, 2, 6, 7  
    biota, 3, 6, 7  
  criteria  
    human health protection, 13, 14  
    natural resources protection, 13  
  effects  
    aquatic organisms, 8, 9  
    birds, 9, 10  
    mammals, 10–12  
    terrestrial invertebrates, 7  
    terrestrial plants, 7, 8  
  metabolism, 5, 6, 10, 12  
  mutagenicity, 7  
  odor threshold, 11, 13  
  persistence, 3, 5, 15  
  recommendations, 12  
  sources, 1, 2, 14  
  uses, 1, 3  
Acrylamide, 9  
Acrylic acid, 2, 3, 11, 12  
Acrylic acid esters, 2, 3  
Acrylonitrile, 9, 11, 204, 210, 226  
Actinides, 716, 732  
Actinium-227, 682, 687, 688, 722  
Actinium-228, 682  
Adenosine triphosphate, 6, 23, 35, 83, 145, 147, 166, 186, 187, 199, 201, 206, 216, 221, 225, 226, 300, 360, 361, 418, 562, 710, 766, 813  
Adiponitrile, 210  
Adirondack Mountain region, New York, 417  
Adriatic Sea, 443, 705  
Asthenic-vegetative syndrome, 422  
Africa, 175, 223, 316, 318, 342, 345, 352, 369, 433, 473, 474, 783, 796, 830  
AG-500, 234  
Agent orange, 262, 277  
Agmatrin, 295  
Agricide Maggot Killer, 830  
Agra City, India, 440  
Agricultural drainwaters, 59, 520  
Alabama, 503, 510, 517, 784  
Alachlor, 590  
Alamosa River, Colorado, 356  
Alanine, 222, 332, 340  
Alaska, 135, 284, 315–317, 319–321, 352, 354, 373, 381, 404, 419, 431, 443, 483, 513, 518, 652, 854  
Albany, New York, 513, 629  
Alberta, Canada, 89, 159, 192, 317, 409, 566, 591, 878, 883  
Albumin, 142, 168, 179, 271, 324, 327, 329, 334, 335, 422, 537, 538, 561, 585, 846, 859, 868, 876, 877  
Alcohol dehydrogenase, 794, 845

## General Index

---

- Aldoximes, 216, 361  
 Aldehyde dehydrogenase, 9, 10  
 Aldrin, 51, 124  
 Alfa-tox, 234  
 Algeria, 829  
 Alkali disease, 748, 749  
 Alkaline phosphatase, 104, 147, 185, 507, 542, 563, 577, 845, 847, 853, 861, 864  
 Alkyl cyanates, 205  
 Alkyl isocyanates, 205  
 Alkylmercury, 417, 419, 423, 437  
 Alkyl phenols, 574  
 Allantois, 392  
 Allergic contact dermatitis, 12, 348, 349, 367, 370, 850  
 Allethrin, 293, 299  
 Allochrysin, 337, 338  
 Alltech SK-4, 619  
 Alltox, 830  
 Allyl alcohol, 2, 6, 8  
 Allylamine, 12  
 Allyl formate, 2  
 Alpha particles, 680, 732  
 Alpine, Texas, 785  
 Alps, 331  
 Alton, Illinois, 117  
 Aluminum, 3, 22, 30, 61, 62, 169, 174, 187, 212, 320, 325, 343, 351, 375, 414, 417, 444, 517, 563, 781, 827  
 Aluminum borates, 61  
 Aluminum oxide, 62  
 Amalgams, 415, 448  
 Amazon River, 344, 476  
 Amazonia, 213, 316, 318, 344, 476–478, 480, 497  
 Amdro, 516  
 American Contact Dermatitis Society, 348  
 American Cyanamid 38023, 281  
 American Ornithologists' Union, 108  
 Americium-241, 686, 692, 697, 723, 727, 728, 731  
 Americium-243, 727  
 Amerindians, 414, 497  
 Ames test, 27, 659, 663, 665  
 Amine-carboxyboranes, 60, 74  
 O-Aminoacetophone, 221  
 L-Amino acid oxidase, 206  
 Gamma-amino butyric acid (GABA), 300  
 Alpha-amino-butyronitrile, 216  
 2-Amino-4-chloro-6-ethylamino-1,3,5-triazine, 55  
 2-Amino-4-chloro-6-isopropylamino-1,3,5-triazine, 55  
 (1-Aminocyclopropane-1-carboxylic acid) oxidase, 216  
 Delta Aminolevulinic acid dehydratase, 377, 382, 386, 388, 390, 392–395, 401  
 Delta Aminolevulinic acid synthetase, 613  
 p-Aminopropiophenone, 208, 209  
 2-Aminothiazoline-4-carboxylic acid, 206  
 Amitrol, 574  
 Amituk Lake, Canadian Arctic, 419  
 Ammonia, 104, 165, 203, 205, 214, 216, 220, 226, 326, 355, 358, 415, 575, 766, 775, 781  
 Ammonium alginate, 591  
 Ammonium borates, 69  
 Ammonium chromate, 154  
 Ammonium diuranate, 685  
 Ammonium hexacyanoferrate, 706  
 Ammonium hydroxide, 537  
 Ammonium molybdate, 191, 197  
 Ammonium thiocyanate, 210  
 Amobarbitol, 123  
 Amoco AX-21, 619  
 Amphibians  
   acrolein, 8  
   arsenic, 21, 26  
   atrazine, 53  
   boron, 63, 65, 68, 75  
   cadmium, 84, 87  
   carbofuran, 96, 105  
   chlordane, 118, 122  
   chlorpyrifos, 134  
   chromium, 145–148  
   copper, 163, 173, 178, 196  
   cyanide, 206, 219  
   diazinon, 238  
   diflubenzuron, 249, 259  
   dioxins, 269  
   fenvalerate, 294, 298, 303, 305, 311  
   gold, 355, 360, 363  
   lead, 383, 388, 392  
   mercury, 434, 435, 459  
   mirex, 511  
   molybdenum, 521–524, 529  
   nickel, 551, 552  
   paraquat, 580, 587  
   pentachlorophenol, 597  
   polychlorinated biphenyls, 637  
   polycyclic aromatic hydrocarbons, 665  
   radiation, 717  
   selenium, 749, 750  
   silver, 772  
   sodium monofluoroacetate, 798  
   zinc, 848, 874, 875, 866  
 Amygdalin, 201, 202, 212  
 Amyl mercuric chloride, 454  
 Amylnitrite, 231  
 Angers, France, 415  
 Anglesite, 373, 375

*General Index*

- Angola, 345  
 Aniline, 208  
 Anisoles, 593, 596, 601  
 Antarctic Ocean, 180, 832  
 Antarctica, 443, 620  
 Anthanthrene, 648, 664  
 Anthracene, 631, 647, 648, 650, 657, 660, 662, 665, 669–672, 674, 675  
 Antimony, 315, 325, 331, 748, 764  
 Antimony-125 (<sup>125</sup>Sb), 688, 693–698  
 Appalachian region, 318  
 Appledore Island, Maine, 514  
 Aquatic biota  
     acrolein, 8, 9  
     arsenic, 31–33  
     atrazine, 45, 49, 51–54  
     boron, 67, 68, 71  
     cadmium, 83, 91, 93  
     carbofuran, 104, 105  
     chlordane, 121, 122  
     chlorpyrifos, 132, 133, 136  
     chromium, 139, 142, 143, 145–151, 158  
     copper, 165–167, 175–178, 180, 184–189, 192, 193, 198  
     cyanide, 217–220  
     diazinon, 235–237, 239  
     diflubenzuron, 251–254  
     dioxins, 268–270, 275, 278  
     famphur, 285, 286  
     fenvalerate, 304–306, 309  
     gold, 333, 334, 365, 370  
     lead, 382, 383, 389–392  
     mercury, 428, 446, 452, 478, 493, 497  
     mirex, 503, 508  
     molybdenum, 522–525, 529  
     nickel, 551, 557, 558, 564  
     paraquat, 582, 583, 586  
     pentachlorophenol, 597–599  
     polychlorinated biphenyls, 625–630, 634, 635, 639, 642  
     polycyclic aromatic hydrocarbons, 660–665  
     radiation, 705, 706, 714–717  
     selenium, 741, 745–747, 749–751, 754, 755, 757, 759  
     silver, 772–776, 779  
     sodium monofluoroacetate, 797, 798  
     tin, 810, 814, 817–821, 825, 826  
     toxaphene, 829, 835, 837, 838  
     zinc, 848, 855–857, 860, 861, 866–874, 878–880  
 Arcachon Bay, France, 177, 816  
 Arctic Ocean, 115, 116, 180, 620, 633, 832  
 Arene oxides, 611, 653, 663  
 Argentina, 1, 407, 478, 587, 761  
 Argentous ion, 765  
 Arginine, 865  
 Argyria, 761, 763, 764, 768, 770, 772, 774, 777, 778, 781, 782  
 Argyrosis, 761, 767, 777  
 Argentite, 761  
 Argon-39, 686  
 Arizona, 80, 157, 162, 203, 221, 222, 358, 360, 365, 373, 488, 518, 603, 640, 669, 762, 838  
 Arkansas, 105, 261, 266, 503, 626–628, 690, 854, 870  
 Arkansas City, Arkansas, 117, 628  
 Armenia, 517  
 Aroclor 1016, 618, 619, 621–623, 626, 634, 637, 640, 641  
 Aroclor 1221, 618, 626, 637, 641  
 Aroclor 1232, 626, 641  
 Aroclor 1242, 612, 618, 619, 621, 622, 626, 640, 641  
 Aroclor 1246, 637  
 Aroclor 1248, 612, 619, 621, 626, 640, 641  
 Aroclor 1254, 447, 612, 618–623, 626, 628, 634, 637–641  
 Aroclor 1260, 618, 619, 626, 636, 639, 641  
 Aroclor 1268, 626  
 Arroyo Colorado, Texas, 832, 833  
 Arsanilic acid, 31, 34, 40, 42  
 Arsenates, 21–23, 25, 30, 32, 34  
 Arsenic, 17–43  
     concentrations in field collections, 24, 25  
         abiotic materials, 25, 26  
         biota, 25  
     criteria, 36, 39, 41, 43  
     deficiency, 23, 42  
     effects, 28–40  
     fate, 18  
     interactions, 23  
     mutagenesis, 28  
     persistence, 29  
     properties, 20–23  
     sources, 18–20  
     teratogenesis, 28  
     uses, 18–20  
 Arsenic acid, 18–20  
 Arsenic pentoxide, 21–26, 28, 29, 31–36, 39, 41, 42, 352  
 Arsenic sulfides, 21, 22  
 Arsenic trioxide, 18, 20–22, 24, 25, 30, 31, 34, 36, 37, 39  
 Arsenites, 21, 23, 30  
 Arsenobetaine, 25–27, 33, 34, 41, 42  
 Arseno sugars, 26  
 Arsenous acid, 23  
 Arsenoxides, 22  
 Arsines, 20–22

## General Index

---

- Arsoniums, 22  
 Arsonous acid, 23  
 Arsphenamine, 19  
 Aryl hydrocarbon hydroxylase (AHH), 613–615,  
     617, 619–621, 624, 627, 630, 635, 637,  
     638, 642, 653, 666  
 2-Aryl-3-methylbutyric acid esters, 294  
 Asana, 293  
 Asarco, 843  
 Ascorbic acid, 61, 83, 138, 153, 167, 171, 172,  
     180, 377, 378, 669, 768  
 Asia, 137, 223, 313, 316, 317, 349, 381, 409,  
     474, 783  
 Aspirin, 600  
 Aspon, 113  
 Astronauts, 724, 729  
 Atlantic flyway, 118, 513  
 Atlantic Ocean, 431  
 Atrazine, 45–57, 105, 581, 590  
     carcinogenicity, 54–56  
     concentrations in  
         abiotic materials, 48, 49  
         biota, 48, 49  
     criteria  
         human health protection, 56, 57  
         natural resources protection, 56, 57  
     effects  
         aquatic animals, 53, 54  
         aquatic plants, 51–53  
         birds, 54  
         mammals, 54, 55  
         terrestrial plants, 49–51  
         terrestrial invertebrates, 49–51  
     environmental chemistry, 45–48  
     metabolism, 47, 49, 50, 53, 54, 56  
     mutagenicity, 54–56  
     persistence, 47, 48, 51, 57  
     properties, 46  
     recommendations, 55, 56  
     solubility, 46, 47  
     transformation, 48, 54  
     uses, 46  
 Atropine, 96, 280, 288, 308, 541, 600  
 Auranofin, 323, 333, 338  
 Auric chloride, 322, 326, 334  
 Aurichloric acid, 326  
 Aurous chloride, 326  
 Australasia, 842  
 Australia, 1, 3, 5, 8, 13, 37, 45, 122, 126, 129, 177,  
     196, 290, 297, 314, 316, 317, 320, 327,  
     342, 343, 366, 368, 369, 374, 385, 397,  
     400, 402, 404, 473, 484, 489, 493, 517,  
     518, 535, 537, 568, 581, 589, 656, 677,  
     710, 748, 762, 764, 783, 784, 786, 787,  
     791, 795, 796, 798, 799, 801, 803–807,  
     860, 874, 883  
 Austria, 383, 409, 495, 697, 704  
 Axel Heiberg Island, 620  
**B**  
 Babylonia, 59, 813  
 Bacteria, sulfate-reducing, 419, 457, 482, 702  
 Baja California, 65, 141  
 BAL (2,3-dimercaptopropanol), 570  
 Baltic Sea, 117, 265, 620, 632, 705, 832  
 Bangladesh, 17, 36, 71, 529  
 Barbiturates, 793, 794, 806  
 Barite, 741  
 Barium, 22, 541, 744  
 Barium-140, 697, 698  
 Barium sulfonate, 150  
 Barren Islands, 514  
 Bastogne, Belgium, 317, 318  
 Basudin, 234  
 Bavaria, 589  
 Bay 70142, 96  
 Bay of Fundy, 514  
 Becquerel, 683, 685, 706, 732, 733  
 Becquerel, H., 677  
 Belarus, Russia, 698  
 Belews Lake, North Carolina, 737, 742  
 Belgium, 126, 153, 318, 658, 692, 783  
 Belle Cahise, Louisiana, 117  
 Belmark, 295  
 Belt, 113, 117, 330, 362, 374, 740  
 Beltsville, Maryland, 102  
 Bendigo, Australia, 343  
 Benelux countries, 489  
 Bentonite, 150, 577, 706  
 Benz(a)anthracene, 649, 650, 657–660, 662–664,  
     668–672, 674  
 Benzaldehyde, 212, 226  
 Benzene, 263, 280, 289, 472, 504, 592, 594, 646,  
     669, 675  
 Benzene hexachloride, 590  
 Benzo(a)fluoranthene, 648, 672  
 Benzo(b)fluoranthene, 649, 658, 666, 671, 672  
 Benzo(g,h,i)fluoranthene, 648  
 Benzo(j)fluoranthene, 649, 672  
 Benzo(k)fluoranthene, 666, 671, 672  
 Benzo(a)fluorene, 648  
 Benzo(b)fluorene, 648  
 Benzo(c)fluorene, 648  
 Benzo(k)fluorine, 655  
 Benzo(a)perylene, 664, 665  
 Benzo(g,h,i)perylene, 648, 650, 655, 657, 664,  
     666, 672  
 Benzo(c)phenanthrene, 649  
 Benzo(a)pyrene, 11, 29, 63, 545, 546, 614,  
     645–647, 649–655, 657–676

*General Index*

- Benzo(e)pyrene, 648, 658, 664, 669  
 Benzo(a)pyrene-7,8-diol, 654, 667  
 Benzo(a)pyrene-8,9-diol, 654  
 Benzo(a)pyrene hydroxylase, 614  
 Benzo(a)pyrene-1,6-quinone, 654  
 Benzo(a)pyrene-3,6-quinone, 654  
 Benzo(a)pyrene-6,12-quinone, 654  
 Benzouinones, 594, 600  
 Benzoylphenyl ureas, 247, 251, 258  
 Benzyl isothiocyanate, 659  
 Bergen Harbor, Norway, 430, 498  
 Bering Sea, 625  
 Berzelius, 737  
*Beta* particles, 732  
 Beydag, Turkey, 414  
 Bicep, 46  
 Big Bear Lake, California, 835  
 Big Horn River, 741  
 Big River, Missouri, 379, 382  
 Bikini Atoll, 677, 693, 716  
 Bincennite, 211  
 Bingham Canyon, Utah, 319  
 Biphenylenes, 278  
 4,4'-Bipyridyl, 579  
 Birds  
   acrolein, 7, 9, 15  
   arsenic, 26–28, 34, 40, 42  
   atrazine, 49, 54, 57  
   boron, 65, 68, 69  
   cadmium, 80–84, 90, 92, 93  
   carbofuran, 95, 96, 99, 101–103, 106, 108, 109  
   chlordane, 111, 114, 118, 119, 122, 123, 125, 127, 128  
   chlorpyrifos, 132, 133, 136  
   chromium, 141, 143, 147, 151, 152, 155  
   copper, 161, 163, 169, 171, 173, 175, 178–180, 189, 190, 198–200  
   cyanide, 202, 203, 211, 215, 219–221, 227, 228, 230, 232  
   diazinon, 233, 235–237, 239–243  
   diflubenzuron, 245, 247, 249, 250, 254, 255, 257, 259  
   dioxins, 261, 263–265, 267, 270–272, 274, 275, 277, 278  
   famphur, 279, 280, 283, 286–291  
   fenvalerate, 294, 298, 299, 301–303, 306, 308, 310, 311  
   gold, 353, 355, 358–363, 365  
   lead, 372, 377, 378, 383–386, 388, 392–394, 398, 403–405  
   mercury, 409, 418, 425, 428, 429, 431, 435–439, 441, 445–447, 456, 459–461, 471, 477, 478, 482–484, 486, 487, 493, 494, 499–501  
   mirex, 503–508, 510, 511, 513, 514  
   molybdenum, 521, 522, 525, 528, 529, 532  
   nickel, 546, 552, 554–556, 558, 565, 569–571  
   paraquat, 580, 583, 586, 588  
   pentachlorophenol, 596, 599, 602, 605, 606  
   polychlorinated biphenyls, 613, 630–632, 636, 640, 642, 643  
   polycyclic aromatic hydrocarbons, 651, 654, 665, 675  
   radiation, 687, 690, 691, 696, 700, 703, 708, 710, 717, 718, 720, 731  
   selenium, 737–739, 742, 743, 745, 747, 749, 752, 755, 757–759  
   silver, 768, 770, 771, 776, 782  
   sodium monofluoroacetate, 785, 787, 788, 795–803, 805–807  
   tin, 811, 812, 817, 821, 827  
   toxaphene, 832–836, 840  
   zinc, 841, 843, 845, 847, 851, 853, 857, 858, 861, 874, 875, 880, 887–889  
*O,N*-Bisdesmethylfamphur, 281, 282, 289  
 Bismuth, 209, 321, 324, 325, 404, 412, 518  
 Bismuth-207, 693–696  
 Bismuth-210, 681, 682, 721  
 Bismuth-211, 682  
 Bismuth-212, 682  
 Bismuth-214, 681, 682, 720  
 Bismuth-215, 682  
 Bismuth subnitrate, 209  
 Blackfoot's disease, 17  
 Black Hills, South Dakota, 358, 359  
 Black River, Ohio, 655, 664  
 Black root rot, 212  
 Black Sea, 356, 625  
 Black tail, 225, 390, 687, 691, 744  
 Blind staggers, 748  
 Blue powder, 843  
 Blue-sac disease, 269  
 Bo-Ana, 281  
 Bo Hai Sea, 317  
 Bohemia, 313  
 Bolivia, 316, 474, 478  
 Boracite, 60  
 Boranes, 59–64, 70  
 Borates, 59, 60, 62–64, 66, 67, 69, 70, 74, 75  
 Borax, 59–65, 67, 69, 70, 72, 74, 75  
 Borax decahydrate, 60  
 Borax pentahydrate, 60  
 Borazines, 62  
 Bordeaux mixture, 164  
 Boric acid, 59–63, 65, 67–70, 72–75  
 Boric oxide, 60, 71  
 Bornanes, 829, 830  
 Bornenes, 829, 830

## General Index

---

- Boron, 59–75  
 accumulation, 66, 69–71  
 concentrations in  
   abiotic materials, 59, 60, 62, 64, 65, 67, 68, 71, 74  
   biota, 65, 68  
 criteria  
   human health protection, 71, 72, 75  
   natural resources protection, 71  
 carcinogenicity, 60, 75  
 deficiency, 66, 69, 71, 72, 75  
 effects  
   aquatic organisms, 67, 68  
   birds, 68, 69  
   mammals, 69–71  
   terrestrial invertebrates, 67  
   terrestrial plants, 66, 67  
 environmental chemistry, 59–64  
 measurement, 64, 75  
 mutagenicity, 60, 63, 75  
 mode of action, 62–64, 66, 68  
 properties, 61, 67, 74  
 teratogenicity, 68  
 recommendations, 71, 73  
 sources, 60, 61  
 uses, 60, 61  
 Boron-10, 63  
 Boron atrocalcite, 60  
 Boron hydrides, 63  
 Boron oxide, 62, 73  
 Boron tribromide, 73  
 Boron trichloride, 61  
 Boron trifluoride, 61, 70, 73  
 Boston, Massachusetts, 2  
 Boston Harbor, Massachusetts, 471, 627, 815  
 Botswana, 345, 347  
 Brass, 161, 183, 382, 813, 827, 842, 866, 887  
 Brazil, 153, 157, 316, 318, 341, 344, 353, 366, 368, 412, 414, 443, 472, 474–479, 484, 489, 490, 495, 500, 501, 509, 535, 683, 783  
 Brifur, 96  
 British Columbia, 95, 97, 174, 266, 267, 315, 317, 451, 518, 519, 591, 642, 657, 786, 816  
 British Department of the Environment, 404  
 Brittany, France, 164  
 Brodan, 130  
 Brodifacoum, 788, 807  
 Bromine, 293, 326, 763  
 Bromphenothrin, 299  
 Bronze, 60, 161, 813, 827  
 Brown's Lake, 25  
 Buffalo River, New York, 656  
 Bulgaria, 229, 374, 697, 704  
 Bursa of Fabricius, 637  
 Burundi, 318  
 Butte, Montana, 365  
 Butte Lake, British Columbia, 174  
 Butylated hydroxytoluene, 669  
*t*-Butyl bicyclopophosphorothionate, 300  
 Butyltins, 817, 823  
 Byelorussia, 699  
 Bypyridine, 573
- C**
- Cacodylic acid, 19, 20, 29, 30, 32, 36  
 Cadmium, 77–93  
   bioaccumulation, 85  
   carcinogenesis, 87  
   concentrations in field collections  
     abiotic materials, 79  
     biota, 79  
   criteria  
     human health, 88–93  
     natural resources, 88–93  
   effects  
     lethal, 81, 82  
     sublethal, 82–84  
   environmental chemistry, 77, 78  
   interactions, 82, 92  
   mutagenesis, 87  
   persistence, 85–87  
   teratogenesis, 87  
   uses, 77  
 Cadmium-109, 81, 718  
 Cadmium-113m, 688  
 Cadmium-115m, 678  
 Cadmium chloride, 87, 460  
 Cadmium fluoride, 82  
 Cadmium fluoborate, 82  
 Cadmium oxide, 77  
 Calaverite, 314, 325  
 Calciferol, 68, 807  
 Calcineurin, 542, 562  
 Calcitonin, 865  
 Calcium, 6, 20, 22, 29, 30, 62, 66, 69, 82–84, 124, 167, 170–172, 176, 181, 186, 225, 288, 300, 304, 334, 375, 377, 378, 385, 390, 392, 393, 414, 433, 434  
 Calcium-45, 686, 717  
 Calcium acetate, 545  
 Calcium arsenate, 20, 29, 30  
 Calcium ATPase, 300  
 Calcium borate, 64, 73  
 Calcium carbonate, 89, 91, 144, 158, 182, 193, 220, 358, 375, 392, 397, 564, 774, 775, 779, 867, 873  
 Calcium chloride, 574, 794, 887  
 Calcium cyanamide, 210  
 Calcium cyanide, 202, 210, 225, 326

*General Index*

- Calcium deficiency, 66, 852  
 Calcium gluconate, 794  
 Calcium gluconate, 789, 793, 794, 806  
 Calcium disodium EDTA, 172  
 Calcium trisodium diethylnitramine penta acetic acid, 172  
 California, 9, 27, 34, 60, 61, 64, 65, 68, 95, 96, 118, 122, 129, 132, 135, 137, 157, 158, 163, 203, 222, 230, 233, 241, 242, 250, 303, 313, 314, 317–320, 360, 362, 372, 373, 381, 385–387, 397, 409, 413, 427, 428, 433, 440, 441, 473, 481, 484, 485, 488, 492, 518, 520, 521, 524, 600, 603, 627, 631, 661, 690, 691, 737, 741–744, 749, 752, 758, 762, 771, 780, 784–786, 799, 801, 803, 806, 829  
 Californium-252, 728, 731  
 Calmodulin, 300, 542, 562  
 Calomel, 415, 423  
 Camden, New Jersey, 623, 741  
 Cameroon, 318  
 Camphenes, 830  
 Camphchlor, 830  
 Camphofene, 830  
 Canada, 1, 25, 38, 45, 88, 89, 104, 108, 109, 111, 115, 119, 126, 135, 137, 158, 159, 162, 175, 178, 192, 209, 210, 214, 228, 248, 261, 264, 265, 276, 297, 316, 317, 331, 343, 351–353, 358, 360, 366, 368, 374, 381, 383, 384, 397, 400, 402, 404, 407–409, 414, 434, 440, 443, 451, 471, 484, 485, 488–490, 496, 514, 517, 518, 533, 535–537, 543, 544, 549, 550, 564, 566, 567, 574, 589, 591, 620, 641, 655, 659, 685, 691, 692, 696, 728, 739, 740, 758, 762, 785, 786, 810, 825, 829, 832, 839, 842, 875, 878, 883  
 Canada's Category III Contaminant List, 810  
 Canadian Environmental Protection Act, 533  
 Canadian Yukon, 80, 834  
 Cancer Assessment Group of USEPA, 252  
 Captafol, 105  
 Captan, 241  
 Carbamates, 95, 97, 100, 107, 237, 837  
 Carbaryl, 241  
 Carbofuran  
   carcinogenicity, 103, 107, 109  
   criteria  
     human health protection, 103, 108  
     natural resources protection, 103, 108  
   degradation, 97–99, 103–105, 107–109  
   effects  
     aquatic animals, 100  
     aquatic plants, 100  
     birds, 101–103, 106  
     mammals, 101–103, 106, 107  
     terrestrial invertebrates, 101, 104  
     terrestrial plants, 100  
   interactions, 108  
   mutagenicity, 103, 107, 109  
   metabolism, 103–107  
   persistence, 96, 98  
   properties, 96–99, 100, 102, 107, 109  
   recommendations, 108, 109  
   solubility, 98  
   teratogenicity, 103, 107, 109  
   treatment, 96–98, 100, 102, 104, 108  
 Carbofuran-7-phenol, 98, 107  
 Carbofuranphenol, 105  
 Carbon-14, 727, 734  
 Carbon black, 533, 647  
 Carbon tetrachloride, 124, 209, 463, 504, 592, 660, 850  
 Carbonic anhydrase, 578, 766, 845, 856, 859, 861  
 Carbon monoxide dehydrogenase, 554  
 Carbonic anhydrase, 578, 766, 845, 856, 859, 861  
 Carbonyl nickel powder, 537, 545  
 Carbonyls, 4  
 Carbopol, 796  
 Carboranes, 61  
 Carboxylic acid, 5, 226, 307, 550  
 Carboxymethylcellulose, 574  
 S-Carboxymethylcysteine, 792  
 4-Carboxy-l-methylpyridium ion, 579  
 Carboxypeptidase, 562, 845, 865  
 Carcinogenicity  
   acrolein, 11, 14  
   arsenic, 18, 28, 41–43  
   atrazine, 54–56  
   boron, 60, 75  
   cadmium, 87, 93  
   carbofuran, 103, 107, 109  
   chlordane, 123, 125, 127, 128  
   chromium, 145, 152, 156, 159  
   copper, 172, 197  
   cyanide, 208, 226, 231, 232  
   diazinon, 238  
   diflubenzuron, 256  
   dioxins, 275  
   famphur, 288–291  
   fenvalerate, 301  
   gold, 336, 348, 350, 367, 369  
   lead, 371, 372, 395  
   mercury, 447, 448  
   mirex, 506, 514, 516  
   molybdenum, 522  
   nickel, 538, 541–545, 563  
   pentachlorophenol, 605, 606  
   polychlorinated biphenyls, 613, 634, 637  
   polycyclic aromatic hydrocarbons, 668, 669  
   radiation, 719, 735  
   silver, 781

## General Index

---

- Carcinogenicity (cont'd)  
 tin, 810–812  
 toxaphene, 836, 840  
 zinc, 851  
 Carnosine, 570  
 Carson River, Nevada, 412, 413,  
 474, 482  
 Carson Sink, 482  
 CAS 52-85-7, 281  
 CAS 87-86-5, 592  
 CAS 107-02-8, 4  
 CAS 131-52-2, 592  
 CAS 143-33-9, 204  
 CAS 151-50-8, 204  
 CAS 333-41-5, 234  
 CAS 1563-66-2, 96  
 CAS 1746-01-6, 263  
 CAS 1910-42-5, 576  
 CAS 2385-85-5, 503  
 CAS 2921-88-2, 130  
 CAS 4685-14-17, 576  
 CAS 5103-71-9, 113  
 CAS 5103-74-2, 113  
 CAS 7440-02-0, 537  
 CAS 7440-66-6, 844  
 CAS 7646-85-7, 844  
 CAS 7733-02-0, 844  
 CAS 8001-35-2, 830  
 CAS 35367-38-5, 246  
 CAS 51630-58-1, 295  
 Casein, 24, 578  
 Cassiterite, 810, 813  
 Castle Lake, California, 524  
 Catalase, 206, 207, 216, 361, 417, 421, 576,  
 577, 582  
 Catechols, 593, 601  
 CD-68, 113  
 Cekuquat, 576  
 Celatom MP-78, 211  
 Celiac disease, 877  
 Cellulose, 247  
 Central America, 304  
 Central Valley, California, 129  
 Cerium-141, 697, 698  
 Cerium-143, 686  
 Cerium-144, 697, 698, 723  
 Cerium chloride, 578  
 Ceruloplasmin, 166–168, 172, 181, 191,  
 527, 528  
 Cerusite, 373  
 Cesium, 690, 704, 706–709, 715, 722  
 Cesium-134, 697, 698, 725  
 Cesium-135, 727  
 Cesium-137, 692, 696, 697, 707, 713,  
 725–728, 731  
 CH<sub>2</sub>FCOOH, 783  
 CH<sub>2</sub>FCOONa, 783, 789, 807  
 Chalcocite, 162  
 Chalcopyrite, 162, 318, 340, 373  
 Charlotte Harbor, Florida, 33  
 Chelated copper, 163, 164  
 Chem-penta, 592  
 Chemtrol, 592  
 Chernobyl Atomic Power Station Zone, 699  
 Chernobyl, Ukraine, 696, 730  
 Chesapeake Bay, 26, 27, 45, 49, 51, 52, 54, 90,  
 174, 193, 194, 196, 386, 449, 513, 658,  
 771, 773, 774, 814, 832, 833  
 Chester, Illinois, 117  
 Chicago, 553  
 Chick edema disease, 271  
 Chile, 17, 38, 162, 340, 518, 762  
 China, 60, 175, 316, 317, 352, 366, 368, 374,  
 443, 471, 473, 474, 517, 518, 677,  
 683, 688, 696, 737, 814  
 Chinese Hamster Ovary Cells, 7, 27, 29, 240,  
 546, 600, 688, 852  
 Chitin, 245–247, 250, 252, 253, 255,  
 257, 258  
 Chitinase, 247  
 Chitin synthetase, 245, 247, 250, 252  
 Chloracne, 273, 600, 634  
*Alpha*-chloralase, 807  
 Chloralkali industry, 407, 410, 437, 476, 497  
 Chlor-dan, 113  
 Chlordane, 111–128  
   carcinogenicity, 123, 125, 127, 128  
   concentrations in  
     abiotic materials, 115, 116  
     biota, 114, 121, 127  
   criteria  
     human health protection, 117, 125–128  
     natural resources protection, 125, 126  
   effects  
     amphibians, 122  
     aquatic biota, 121, 122  
     birds, 122, 123  
     mammals, 123–125  
     reptiles, 122  
     terrestrial invertebrates, 120  
   health advisories, 117, 126  
   measurement, 116, 127  
   mode of action, 113, 144  
   mutagenicity, 124  
   persistence, 111, 114–116, 119, 122, 125  
   production, 111, 115, 123, 125, 127  
   properties  
     biochemical, 111–115  
     chemical, 111–115  
   recommendations, 125–127  
   transport, 111, 113, 115, 118, 125, 127  
   uses, 115



*General Index*

- Alpha*-Chlordane, 112  
*Cis*-Chlordane, 112–124, 126, 127  
*Gamma*-Chlordane, 112  
*Trans*-Chlordane, 112–114, 116, 117, 119–121, 123, 124, 126, 127  
 Chlordene, 112, 113, 124  
 3-Chlordene, 124  
 Chlordene chlorohydrin, 114, 121  
 Chlordene epoxide, 124  
 Chlorfluzaron, 251  
 Chlorinated camphene, 829, 830, 839  
 Chlorinated diphenyl ethers, 593, 599, 601  
 Chlorinated 2-phenoxyphenols, 593  
 Chlorindan, 113  
 Chlorine, 47, 111, 112, 114, 214, 261–264, 274, 293, 326, 355, 358, 410, 414, 437, 488, 497, 503, 504, 608–612, 617, 622, 634, 635, 638, 643, 650, 763, 770, 829, 830, 833, 839, 856  
 Chlor-kil, 113  
 Chlornitofen, 262  
 2-Chloro-4-amino-6-isopropylamino-*s*-triazine, 52  
 4-Chloroaniline, 258  
 Chloroanisoles, 599  
 Chlorobenzenes, 621  
 2-Chlorobiphenyl, 622, 638  
 4-Chlorobiphenyl, 636  
 4'-Chloro-3,4-biphenyldiol, 637  
 4'-Chloro-4-biphenylol, 637  
 Chlorobischolyglycinatogold<sup>+3</sup>, 339  
 Chlorobornanes, 837  
 2-Chlorochlordene, 124  
 Chlorodane, 113  
 2-Chloro-4,6-diamino-1,3,5-triazine, 55  
 2-Chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine, 45, 46, 56  
 Chloroform, 46, 52, 263, 295  
 Chlorohydrin, 114, 121  
 4-Chloro-4'-hydroxybiphenyl, 636  
 4-Chloro-*alpha*-(1-methylethyl-benzeneacetic acid cyano (3-phenoxyphenyl)methyl ester, 295  
 4'-Chloro-3-methoxy-4-biphenylol, 637  
 Chlorophen, 592  
 Chlorophenols, 261, 262, 265, 272, 590, 593, 596, 600, 601, 606  
*N*-[[4-(4-Chlorophenyl)amino]carbonyl]-2,6-difluorobenzamide, 246  
*N*-[[4-(4-Chlorophenyl)amino]carbonyl]-2,6-difluoro-3-hydroxybenzamide], 257  
 1-(4-Chlorophenyl)-3-(2,6-difluorobenzoyl)urea, 245, 246, 258  
 4-Chlorophenyl isocyanate, 246  
 2-(4-Chlorophenyl)-3-methylbutyric acid, 306  
 3-(4-Chlorophenyl) isovaleric acid, 301  
 Chlorophenylols, 638  
 4-Chlorophenylurea, 245–247, 251, 253, 255, 256, 258  
 Chlorosis, 30, 50, 66, 67, 180, 550, 556, 601  
 Chlorpyrifos, 129–136  
     criteria  
         to protect human health, 135  
         to protect natural resources, 135  
     effects  
         aquatic organisms, 132, 133  
         birds, 133, 134  
         mammals, 133, 134  
     environmental chemistry, 129–131  
     formulations, 129, 130, 135  
     metabolism, 131, 134  
     mutagenicity, 134  
     persistence, 129, 131  
     properties, 129, 130  
     recommendations, 135  
     structure, 131  
     uses, 130  
 Chlorpyrifos oxon, 131, 133  
 Chlorpyrifos-ethyl, 130  
 Chlortox, 113  
 Cholanthrene, 649, 667  
 Cholecalciferol, 68, 807  
 Cholesterol, 60, 65, 74, 141, 191, 299, 302, 555, 556, 865, 872, 886  
 Cholesterol(2*R*)-2-(4-chlorophenol) isovalerate (CPIA-cholesterol ester), 302  
 Cholestyramine, 600  
 Choline, 660, 748  
 Cholinesterase, 95, 96, 101–103, 106, 123, 132, 234–237, 239, 240, 242, 243, 279, 280, 283–291  
 Chromate zinc phosphate, 155  
 Chromated copper arsenate, 155, 163  
 Chromates, 137, 138, 153, 154  
 Chrome lignosulfonates, 150  
 Chromic acid, 137, 144, 157  
 Chromic oxide, 138, 147, 151  
 Chromites, 137, 138  
 Chromium, 137–160  
     beneficial and protective properties, 141, 142  
     carcinogenicity, 145, 152, 153  
     concentrations in field collections, 140, 141  
     criteria  
         human health protection, 157–159  
         natural resources protection, 157–159  
     effects  
         lethal, 142–144  
         sublethal, 145–154  
     environmental chemistry, 137–139  
     field investigations, 154–156

## General Index

---

- Chromium (cont'd)  
 interactions, 138, 156  
 lethality, 142–145  
 mutagenicity, 145, 152, 153  
 persistence, 139  
 teratogenicity, 145, 152, 153  
 uses, 138
- Chromium-51, 154
- Chryseis, 323
- Chrysene, 649, 657, 658, 661–664, 666, 671, 672
- Chrysotherapy, 323, 327–330, 336, 338
- CI 77949, 843
- Cibola Lake, 742
- Cinchocaine chloride, 70
- Cinnamon, 788
- Cinnabar, 407, 409, 410, 412, 413, 420, 427, 429, 433, 498, 788
- C.I. No. 77775, 537
- CI pigment metal 6, 843
- Circle Mining District, 315
- Cismethrin, 293, 299
- Citrate, 550, 783, 788, 792–794, 796, 797, 799, 803, 807
- Citric acid, 164, 207, 597
- CL 38023, 281
- Clark Fork River, Montana, 25
- Clay Lake, Ontario, 431
- Clayton Lake, New Mexico, 831
- Clean Water Effluent Guideline, 533
- Cleft palate, 12, 87, 153, 273, 274, 425, 449, 506, 615, 638
- Climax, Colorado, 518
- Clofibrate, 577
- Clo Mor, 80
- Clophen, 618
- Clophen A-30, 618
- Clophen A-40, 618
- Clophen A-50, 618
- Clophen A-60, 618
- Clor Chem T-590, 830
- Cobalt, 18, 86, 176, 202, 208, 209, 215, 232, 331–333, 349, 518, 541, 545, 696, 848, 868
- Cobalt-57, 686, 693
- Cobalt-58, 686, 685
- Cobalt-60, 696, 728, 731
- Cobalt chloride, 209
- Cobaltdetate, 208
- Cobalt histidine, 209
- Coeur d'Alene mining district, 762
- Coeur d'Alene River Basin, Idaho, 385
- Colemanite, 60
- Collagen, 3, 505, 577, 836, 849, 866
- Collargo, 777
- Colorado, 20, 48, 140, 157–159, 211, 319, 356, 373, 374, 387, 517, 518, 524, 626, 627, 655, 689, 692, 738, 741, 746, 762, 769, 771, 784, 785, 832, 870
- Colorado River, 769
- Colorado River Valley, 742
- Columbia, South America, 352, 737
- Columbia River, 5, 382, 691, 718
- Columbia River Basin, Washington, 8
- Committee on the Assessment of PCBs in the Environment, 607
- Commodity List of Explosives and Other Dangerous Articles, 61
- Complex cyanides, 203–205, 215, 219
- Compound 1080, 783–789, 791, 796, 803, 806
- Comstock Lode, Nevada, 481
- Congo, 318
- Connecticut, 195, 237, 401, 488, 553, 640, 669, 690, 762, 825
- Copper, 161–200  
 carcinogenicity, 172, 197  
 concentrations in  
   abiotic materials, 174  
   biota, 175–178  
 criteria  
   human health, 191–198  
   natural resources, 191–198  
 deficiency, 161, 167, 168, 180–182, 191, 192, 194–200  
 effects, lethal and sublethal, 182–191  
 interactions, 169–172  
 metabolism, 164, 166–169  
 mutagenicity, 172, 173  
 persistence, 165, 168  
 properties, 164–172  
 recommendations, 191, 196–198  
 teratogenicity, 173  
 sources, 161, 162  
 uses, 161–164
- Copper-63, 164
- Copper-65, 164
- Copper acetoarsenite, 34
- Copper acetyl acetonate, 164
- Copper aquo ion, 165
- Copper arsenate, 155, 163
- Copper carbonate, 164, 165, 167
- Copper carbonato compounds, 165
- Copper chloride, 164, 191
- Copper cyanide, 215
- Copper deficiency, 142, 161, 167, 180–182, 191, 197–199, 519, 520, 526–528, 531, 532, 847, 849, 876, 877, 883
- Copper dimethyl dithiocarbamate, 164
- Copper hydroxide, 165
- Copper 8-hydroxyquinoline, 172

*General Index*

- Copper oxide, 164  
 Copper pentachlorophenate, 164  
 Copper ricinoleate, 164  
 Copper rosinate, 164  
 Copper sulfate, 163, 164, 175, 184, 190, 191, 198, 517, 519, 526, 528, 578  
 Copper sulfate pentahydrate, 163  
 Copper-tartaric acid, 164  
 Copper zinc superoxide dismutase, 83, 166, 851  
 Coproporphyrinogen, 377, 392  
 Corodane, 113  
 Coronene, 646, 648, 66, 675  
 Corpus Christi, Texas, 27, 743, 833  
 Corrosive sublimate, 415  
 Corticosteroids, 14  
 Cortilan-neu, 113  
 Cortisol, 134, 146, 637, 662, 701  
 Cosmic rays, 679–681, 684, 713, 733, 735  
 Coulomb, 683  
 Coumatetralyl, 788  
 Council of European Communities, 533  
 CPIA-carboxyesterase, 302  
 CPIA-cholesterol ester, 302  
 Creatinine kinase, 221  
 Creosote, 650–652, 658  
 Cresylic acid, 189  
 Crisfuran, 96  
 Crisquat, 576  
 Cristofuran, 96  
 Cristoxo, 830  
 Criteria  
     human health protection  
         acrolein, 13, 14  
         arsenic, 37  
         atrazine, 56  
         boron, 72–74  
         cadmium, 88  
         carbofuran, 103, 108  
         chlordane, 126–128  
         chlorpyrifos, 135  
         chromium, 157, 158  
         copper, 195, 196  
         cyanide, 227–230, 232  
         diazinon, 242  
         diflubenzuron, 259  
         dioxins, 276, 277  
         famphur, 280, 288  
         fenvalerate, 310, 311  
         gold, 362, 367  
         lead, 396, 401, 403  
         mercury, 488–492  
         mirex, 513–515  
         molybdenum, 530, 531  
         nickel, 567, 568  
         paraquat, 587  
         pentachlorophenol, 603, 604  
         polychlorinated biphenyls, 640, 641  
         polycyclic aromatic hydrocarbons, 669–671, 673, 676  
         radiation, 724–729  
         selenium, 753, 756, 757  
         silver, 778–781  
         sodium monofluoroacetate, 805–807  
         tin, 825, 826  
         toxaphene, 837–839  
         zinc, 882, 883  
     natural resource protection  
         acrolein, 13  
         arsenic, 39, 40  
         atrazine, 55  
         boron, 71, 72  
         cadmium, 89–91  
         carbofuran, 99  
         chlordane, 125, 126  
         chlorpyrifos, 135  
         chromium, 158, 159  
         copper, 192–195  
         cyanide, 232  
         diazinon, 241, 243  
         diflubenzuron, 257–259  
         dioxins, 275, 276  
         famphur, 289  
         fenvalerate, 309, 310  
         gold, 362  
         lead, 397–401  
         mercury, 484–488  
         mirex, 516  
         molybdenum, 529, 530  
         nickel, 564–567  
         paraquat, 586, 587  
         pentachlorophenol, 602, 603  
         polychlorinated biphenyls, 639, 640  
         polycyclic aromatic hydrocarbons, 676  
         radiation, 724, 731  
         selenium, 738  
         silver, 779  
         sodium monofluoroacetate, 784–787, 789, 793, 794, 800, 806, 807  
         tin, 825  
         toxaphene, 838  
         zinc, 878–882  
 Croesus, 321  
 Cuba, 443, 535  
 Cuiba River, Brazil, 478  
 Cumbria, 705  
 Cupric acetate, 170  
 Cupric hydroxide, 165  
 Cupric oleinate, 164  
 Cupric oxide, 165  
 Cupric sulfide, 165  
 Cuprol, 164  
 Cuprous arsenite, 20

## General Index

- Cuprous oxide, 826  
 Curaterr, 96  
 Curie, 683, 685, 732, 733  
 Curium-242, 686, 697  
 Curium-243, 697  
 Curium-244, 686, 697, 715  
 Curium-247, 686  
 Curium-248, 686  
 Cuyaga Lake, New York, 656  
 Cyanates, 205  
 Cyanide, 201–232  
   antidotes, 208, 209  
   carcinogenicity, 208, 226, 231, 232  
   concentrations in  
     abiotic materials, 219, 220  
     biota, 213, 214, 216, 220  
   criteria  
     to protect human health, 228, 232  
     to protect natural resources, 232  
   effects  
     aquatic biota, 215, 217–220  
     birds, 215, 220–222  
     mammals, 215, 222–226  
     terrestrial invertebrates, 215–217  
     terrestrial plants, 215–217  
   mode of action, 205, 216, 219  
   measurement, 205, 208, 214  
   metabolism, 205, 206, 208, 213, 214, 216, 218, 220, 221, 225, 227, 232  
   mutagenicity, 215  
   odor threshold, 205  
   persistence, 214, 215, 222, 230  
   poisoning, 201–203, 206–209, 212, 216, 217, 221–223, 225, 226, 229–232  
   properties, 203, 204, 220, 231, 232  
   recommendations, 227–231  
   sources, 201, 207, 209, 212, 217, 222, 230, 231  
   teratogenicity, 208, 226, 231, 232  
   uses, 201, 209–213  
 Cyanide and gold extraction, 224  
   criteria  
     human health, 228–230, 232  
     natural resources, 227, 228  
   hazards to biota, 202, 230  
   history, 353–356  
   mitigation, 361, 362  
   pit lakes, 364, 365  
   recommendations, 227–231  
   water management issues, 362–364  
 Cyanides, weak-acid dissociable, 221, 222, 355, 360  
 Cyanic acid, 204  
 Beta-Cyanoalanine, 216  
 Cyanocobalamin, 206, 209  
 Cyanogen, 204, 205, 210  
 Cyanogen bromide, 210  
 Cyanogen chloride, 210, 215, 355  
 Cyanoglycosides, 205, 212  
 Cyanogenic glycosides, 201–204, 209, 212, 213, 216, 217, 222, 223, 231  
 Cyanohydric acid, 203  
 Cyanohydrins, 204, 216, 217, 361  
 Cyanophenoxybenzyl pyrethroids, 293  
   *Alpha*-Cyano-3-phenoxybenzyl  
     *alpha*-(4-chlorophenyl) isovalerate, 295  
   *Alpha*-Cyano-3-phenoxybenzyl  
     2-(4-chlorophenyl)-3-methylbutyrate, 295  
   *Alpha*-Cyano-3-phenoxybenzyl alcohol, 294, 296, 299  
   (*RS*) *alpha*-Cyano-3 phenoxybenzyl (*RS*)  
     2-(4-chlorophenyl)-3-methylbutyrate, 293, 295, 311  
   Cyano(3-phenoxyphenyl)methyl 4-chloro-*alpha*-(1-methylethyl)benzeneacetate, 295  
   *Alpha* Cyano pyrethroids, 300, 301  
 Cyanopyridines, 202, 213  
 Cyanurates, 205  
 Cycasin, 202  
 Cyclam, 323, 542  
 Cyclethrin, 293  
 Cyclohexanediamine tetraacetic acid, 542  
 Cyclopentadiene, 111, 113  
 Cyclophosphamide, 2, 6, 11  
 Cyflee, 281  
 Cyhexatin, 824  
 Cypermethrin, 299  
 Cysteamine, 793  
 Cysteine, 6, 55, 138, 184, 328, 340, 418, 424, 463, 465, 526, 577, 846, 847, 859  
 Cystine, 206, 222, 520  
 Cytochrome oxidase, 166, 181, 199, 201, 202, 205–208, 216, 218, 220, 225, 230–232, 356, 357, 360–362, 563, 876  
 Cytochrome c oxidase, 166, 168, 205, 206, 208  
 Cytochrome P450, 47, 608, 611, 613, 617, 632, 635, 636, 637, 639, 641, 642, 653, 658, 665, 668, 813, 819, 820  
 Cytochrome P4501A1, 267, 614, 642  
 Cytochrome reductase, 576  
 Cytokine, 337, 348, 544  
 Czech Republic, 332, 355, 386  
 Czechoslovakia, 13, 30, 39, 229, 697, 708, 859

## D

- 2,4-D, 262, 264, 277, 574  
 D-1221, 96  
 Dahlonaga, Georgia, 483

*General Index*

- Dalapon, 574  
 Danube River, 705  
 Davis Lake, Oregon, 831  
 Dayton, Ohio, 2  
 Dazzel, 234  
 DDD, 833  
 DDE, 124, 446, 511, 631, 832, 833  
 DDT, 95, 115, 116, 118, 299, 461, 506, 508–511, 513, 621, 624, 639, 829, 831, 836, 837, 855, 867  
 Decaborane, 59, 61, 63, 73  
 Decachlorobiphenyl, 608, 611  
 Decarboxyfenvalerate, 298, 301  
 Dechlorane, 503, 511, 513  
 Dechlorane 510, 503  
 Dechlorane 4070, 503  
 Deethylated atrazine, 47, 52  
 Deethylatrazine, 50, 54  
 Deethylhydroxyatrazine, 50  
 Deficiency effects  
     acrolein, 11  
     arsenic, 42  
     atrazine, 54, 56, 57  
     boron, 67–69, 71, 72, 75  
     cadmium, 83  
     carbofuran, 103, 108  
     chlordan, 113, 124  
     chromium, 141, 142, 150  
     copper, 180–182, 198, 199  
     cyanide, 207, 222, 223  
     diazinon, 243  
     fenvalerate, 293, 299  
     molybdenum, 517, 521–523, 529  
     nickel, 554, 555, 570, 571  
     selenium, 743, 753, 754, 758  
     zinc, 860, 861, 863, 886, 888  
 Deflubenzon, 246  
 Dehydroascorbic acid, 62, 209  
 Dehydrodiazinon, 240  
 Deisopropylated atrazine, 47, 52  
 Deisopropylatrazine, 54  
 Deisopropylhydroxyatrazine, 50  
 Delaware, 32, 91, 118, 196, 287, 492, 741  
 Delaware River, 741  
 Deltamethrin, 293, 299  
 Dengue fever, 342, 369  
 Denmark, 74, 402, 404, 439, 642, 691, 764, 829  
 Dental amalgams, 411, 413, 439, 495, 499, 763  
 Dental nickel prostheses, 544  
 Denver, Colorado, 741  
 Denver Wildlife Research Center, 783  
*N*-Desmethylfamphur, 282  
*O*-Desmethylfamphur, 281, 282  
 Des Plaines River, Illinois, 48  
 Detroit, 153, 382, 655  
 Detroit River, Michigan, 655  
 Deuterium, 678  
 Devonshire Colic, 374  
 Dextrone, 576  
 Dextrone X, 576  
 Dexuron, 576  
 DFP, 807  
 Dhurrin, 213  
 Diagran, 234  
 Dialkyl lead, 376  
 Dialkylorganotin, 812  
 Diaminoatrazine, 812  
 Dianon, 234  
 DiaterFos, 234  
 Diazajet, 234  
 Diazatol, 234  
 Diazepam, 301, 305, 839  
 Diazide, 234  
 Diazinon, 233–243  
     carcinogenicity, 256  
     criteria  
         to protect human health, 242  
         to protect natural resources, 241, 242  
     effects  
         aquatic organisms, 235, 237, 238, 241–243  
         birds, 233, 235–237, 239–243  
         mammals, 233, 235, 237–243  
         terrestrial invertebrates, 237, 240  
         metabolism, 235, 236, 238, 240, 241  
         mutagenicity, 237, 242  
         persistence, 234, 238, 240, 242  
         recommendations, 241  
         teratogenicity, 237, 239  
         uses, 233  
 Diazinon AG 500, 234  
 Diazinon 4E, 237  
 Diazinon 14G, 236, 241  
 Diazol, 234  
 Diazoxon, 235–242  
 Dibenz(a,c)anthracene, 649, 669  
 Dibenz(a,h)anthracene, 649, 666, 668, 669, 671, 674  
 Dibenz(a,j)anthracene, 649  
 Dibenzanthracenes, 670  
 Dibenzo-*p*-dioxins, 261, 278, 593, 595  
 Dibenzo(a,c)fluorene, 649  
 2,3,7,8-Dibenzofuran, 264, 267  
 Dibenzofurans, 264, 267, 278, 590, 593, 595, 596, 598–601, 606, 619, 621, 631, 641  
 Dibenzo(a,e)pyrene, 649  
 Dibenzo(a,g)fluorene, 649  
 Dibenzo(a,h)fluorene, 649  
 Dibenzo(a,h)pyrene, 649  
 Dibenzo(a,i)pyrene, 649  
 Dibenzo(a,l)pyrene, 649

## General Index

- Diborane, 50, 61, 72  
 Dibutylmethyltins, 811  
 Dibutyltin dichloride, 818, 825  
 Dibutyltin disulfide, 825  
 Dibutyltins, 812, 813, 822, 825  
 Dichlorobenzene, 263  
 2,2'-Dichlorobiphenyl, 609, 622  
 2,4'-Dichlorobiphenyl, 609  
 2,6'-Dichlorobiphenyl, 622  
 4,4'-Dichlorobiphenyl, 638  
 Dichlorobiphenyls, 609  
 Dichlorobornane, 830  
 Dichlorochlordene, 113, 114, 121  
 4,4'-Dichloro-3-biphenylol, 638  
 1,2-Dichlorochlordene, 113, 114  
 Dichlorodene, 113  
 Dichloromaleic acid, 594  
 2,4-Dichlorophenol, 593  
 Dichromate, 138, 139  
 Dicobalt ethylenediamine tetraacetic acid, 209  
 Dicrotophos, 287  
 Dicyanoaurate<sup>+</sup>, 329  
 Dicyclohexyltin dichloride, 818  
 Dieldrin, 119, 509, 511, 513, 813, 833  
 Diethyldithiocarbamate, 545  
 Diethyl 2-isopropyl-6-methylpyrimidin-4-yl phosphate, 235  
 Diethyl maleate, 578  
 Diethylenetriamine pentaacetic acid, 172, 542  
 Diethylnitrosamine, 11, 544  
 Diethyl phosphoric acid, 240  
 Diethyl phosphorothioic acid, 240  
 Diethyltin dichloride, 818  
 Diethyltin diiodide, 809  
*N-N*-Diethyl-*m*-toluamide, 308  
*O,O*-Diethyl-*O*-(3,5,6-trichloro-2-pyridyl) phosphate, 133  
 Diflubenuron, 246  
 Diflubenzuron, 245–259  
     application rates, 248, 258  
     carcinogenicity, 256  
     criteria  
         to protect human health, 258  
         to protect natural resources, 257–259  
     effects  
         aquatic organisms, 249–251, 253, 259  
         birds, 245, 247, 249, 250, 254, 255, 257, 259  
         mammals, 245, 250, 255–257  
         terrestrial invertebrates, 250  
         terrestrial plants, 249, 258  
     degradation, 245–251, 255, 258  
     food chain transfer, 257  
     metabolism, 245, 246, 251–253, 255–258  
     mutagenicity, 256  
     persistence, 247, 248, 250, 253  
     properties, 246, 256, 258  
     recommendations, 257  
     teratogenicity, 256  
     uses, 248  
 Difluoroacetone, 794  
 2,6-Difluorobenzamide, 246, 247, 251, 255, 258  
 2,6-Difluorobenzoic acid, 245–247, 251, 255–258  
 1-(2,6-Difluorobenzoyl)-3-(4-chlorophenyl) urea, 246  
 2,6-Difluorohippuric acid, 257  
 2,6-Difluoro-3-hydroxydiflubenzuron, 257  
 1,3-Difluoro-2-propanol (DFP), 794  
 2,3-Dihydro-2,2-dimethyl-1,7-benzofuranyl methyl carbamate, 96, 109  
 Dihydrodiol epoxides, 653, 659  
 7,8-Dihydrodiol-9,10-epoxide, 663  
 Dihydrodiols, 653, 654, 659, 661, 663, 667, 668  
 Dihydropicrotoxinin, 300  
 3,4-Dihydroxybenzoic acid, 264  
 Dihydroxybiphenyls, 593, 601  
 Dihydroxydihydrochlordene, 121  
 Dihydroxyheptachlor, 121  
 4,4'-Dihydroxy 3,5,3',5'-tetrachlorobiphenyl, 638  
 4,4'-Dihydroxy 2',3',5',6'-tetrachlorobiphenyl, 638  
 7 *Beta*, 8 *alpha*-Dihydroxy-7,8,9,10 tetrahydro benzo(*a*)pyrene-9 *alpha*, 10 *alpha*-epoxide, 653  
 Dimercaprol, 424  
 2,3-Dimercapto-1-propane sulfonic acid, 850  
 2,3-Dimercaptosuccinic acid, 396, 850  
 2,3-Dimercaptopropanol, 24, 424, 570  
*N*-(2,3-Dimercaptopropyl)phthalamidic acid, 24  
 2,3-Dimercaptosuccinic acid, 396, 850  
 Dimethoate, 515  
 Dimethoxytetrachlorobenzenes, 596  
 4-Dimethylaminophenol, 208, 209, 232  
*O*-[4-1-(Dimethylamino)sulfonyl]phenyl phosphorothioic acid *O,O*-dimethyl ester, 281  
 Dimethylarsinate, 23  
 Dimethylarsine, 22  
 Dimethylarsinic acid, 20, 22, 23, 33, 36  
 Dimethylarsinous acid, 23  
 Dimethylbenzanthracene, 852  
 7,12-Dimethylbenz(*a*)anthracene, 659, 663, 664, 667–669, 674  
 1,1'-Dimethyl-4,4'-bipyridinium, 573, 576, 588  
 1,1'-Dimethyl-4,4'-bipyridinium dichloride, 576, 588  
 Beta-Dimethylcysteamine, 6  
 Dimethyl diselenide, 738, 739  
*O,O*-Dimethyl *O,p*-(*N,N*-dimethylsulfamoyl) phenyl phosphorothioate, 281  
 Dimethyl *p*-(dimethylsulfamoyl)phenyl phosphorothioate, 281

*General Index*

- O,O*-Dimethyl-*O,p*-(dimethylsulfamoyl)phenyl phosphorothioate, 281  
 Dimethyl *p*-(dimethylsulfamoyl)phenyl phosphorothioate, 281  
*O,O*-Dimethyl *O,p*-(*N,N*-dimethylsulfamoyl) phenyl phosphorothioate, 281  
*O*-Dimethyl hydrogen phosphorothioate, *O*-ester with *p*-hydroxy-*N,N*-dimethylbenzenesulfonamide, 281  
 Dimethylmercury, 416, 419  
*O,O*-Dimethyl *O*-(*p*-nitrophenyl) phosphorothioate, 285  
 Dimethylnitrosamine, 124  
*N,N*-Dimethylquinoneimine, 209  
 Dimethyl selenide, 24, 222, 738, 739  
*p,N,N*-Dimethylsulfamoyl phenol, 282  
*O,p*-(Dimethylsulfamoyl)phenyl *O,O*-dimethyl phosphorothioate, 281  
*p*-(Dimethylsulfamoyl)phenyl dimethyl phosphorothioate, 281  
*p*-(*N,N*-Dimethylsulfamoyl)phenyl glucuronide, 281, 282  
 Dimethyl sulfoxide, 46  
 Dimethyltin dichloride, 818  
 Dimethyltins, 813  
 Dimethyl(2,2,2-trichloro-1-hydroxyethyl) phosphonate, 241  
 Dimilin, 245, 246, 258  
 Dinitrosopiperazine, 545  
 Diolepoxydes, 562  
 Diorganotins, 809, 812, 818, 819, 822  
 Dioxins, 261–278  
     accumulation, 266, 267, 269, 270, 273, 274  
     carcinogenicity, 275  
     concentrations in  
         abiotic materials, 261–264  
         biota, 268, 270, 278  
     criteria  
         human health protection, 277  
         natural resources protection, 275  
     effects  
         aquatic biota, 278  
         birds, 261, 263–265, 267, 270–272, 274, 275, 277, 278  
         mammals, 264, 269, 271–275, 277, 278  
         terrestrial invertebrates, 268  
         terrestrial plants, 268  
     environmental chemistry, 262, 263  
     interactions, 277, 278  
     mutagenicity, 268  
     persistence, 263, 264, 270, 272, 273, 275  
     properties, 262–264, 272, 278  
     recommendations, 274, 275, 277  
     sources, 261, 262, 265, 267, 271, 274, 276, 277  
     teratogenicity, 264  
 Diphacinone, 786  
 Diphenyl ethers, 593, 599, 601, 631  
 5,5-Diphenyl hydantoin, 212  
 Diphenyltin dichloride, 818  
 Diphenyltins, 819, 823  
 Dipropyltin dichloride, 818  
 4,4'-Dipyridyl, 575  
 Disodium calcium cyclohexanediamine tetraacetate, 850  
 Disodium ethylene diamine tetraacetic acid (EDTA), 850  
 Disodium hydroxy-mercurio dibromo fluorescein, 410  
 Disodium methanearsonate, 20  
 Disodium methylarsonate, 29  
 Disodium octaborate tetrahydrate, 62  
 Dithiocarb, 570  
 Dithiocarbamates, 570  
 Dithiomolybdates, 520  
 Dizonon, 234  
 DNA, 7, 8, 10, 29, 84, 107, 155, 171–173, 234, 256, 324, 329, 337, 339, 350, 450, 507, 537–539, 541–544, 571, 577, 581, 653, 656, 667, 675, 689, 709, 710, 712, 715, 717, 718, 721, 730, 732, 768, 841, 843, 845, 851, 853, 860, 861, 887  
 Dodecachlorooctahydro-1,3,4-metheno-2H-cyclobuta(c,d)pentalene, 503, 516  
 Dodecachloropentacyclo 5.3.0.0<sup>2.6</sup>.0<sup>3.9</sup>.0<sup>4.8</sup> decane, 503  
 Dominant lethal bioassay, 301  
 Dominican Republic, 316, 535  
 Dopamine, 166, 225, 300, 804  
 Dopamine *beta*-hydroxylase, 166  
 Dovip, 281  
 Dowchlor, 113  
 Dowicide 7, 592  
 Dowicide EC-7, 592  
 Dowicide G, 592  
 Dow pentachlorophenol, 592  
 DP-2, 592  
 D-penicillamine, 172, 328, 424, 577, 850  
 DU, 246  
 DU 112307, 246  
 Dual paraquat, 576  
 Duphar BV, 246  
 Durotox, 592  
 Dursban, 129, 130, 241  
 Dutch Wadden Sea, 386  
 Duwamish estuary, Washington, 663, 664  
 Dylox, 241  
 Dyzol, 234  
 D.z.n., 234

## General Index

---

### E

East Helena, Montana, 855  
 Ebro Delta, Spain, 384  
*Beta-Ecdysone*, 253  
 Ectrin, 295  
 Ecuador, 316, 428, 485  
 EDTA, 86, 148, 171, 172, 385, 455, 540, 542, 557, 559, 570, 850, 853, 871  
 Effective dose equivalent, 697, 705, 733, 735  
 Eglin Air Force Base, Florida, 264  
 Egypt, 1, 313, 332, 373, 581, 829, 841, 862  
 Elbe River, Germany, 428  
 Electrum, 314  
 Elizabeth River, 174  
 Emanay zinc dust, 843  
 Empire Rheumatism Council, 323  
 Endangered Species Act, 308  
 Endosulfan, 305  
 Endrin, 123, 124  
 England, 17, 25, 59, 73, 134, 163, 178, 202, 211, 214, 241, 372, 384, 385, 394, 397, 402, 404, 438, 473, 475, 499, 514, 517, 519, 543, 581, 627, 687, 690, 692, 705, 819, 827, 829, 855, 867  
 Eniwetok Atoll, 694, 695, 716  
 ENT 9932, 113  
 ENT 19507, 234  
 ENT 25644, 281  
 ENT 25719, 503  
 ENT 27164, 96  
 ENT 29054, 246  
 Epoxide hydrolase, 663  
 Epoxides, 562, 653, 659, 663, 667, 668  
 2,3-Epoxychloridene, 124  
 EPTC, 105  
 Equine piroplasmiasis, 284,  
 Equine sorghum cystitis ataxia, 203  
 Erbon, 262  
 Erythrofluorocitrate, 794  
 Escambia County, Florida, 604  
 Esfenvalerate, 293, 305  
 Esgram, 576  
 Eskimo, 466  
 Essequibo River, Guyana, 356  
 Ethanol, 4, 447, 576, 592, 789, 793, 794, 795, 806  
 Ethanolamine, 163, 164  
 Ethers, 593, 599, 601, 631  
 Ethiopia, 318  
 Ethoxyquin, 189  
 Ethoxyresorufin *O*-deethylase (EROD), 181, 267, 270  
 Ethyl acetate, 46  
 3-Ethyl cholanthrene, 659

Ethyl chloride, 123  
 Ethylene, 216, 574, 850  
 Ethylene oxide, 574  
*N*-Ethyl-*N*-hydroxyethyl nitrosamine, 545  
*N*-Ethyl-*N*-nitrosourea, 851  
 Ethyl parathion, 829  
*O*-Ethyltrichloropyridyl phosphorothioate, 131  
 Europe, 17, 56, 59, 88, 89, 137, 157, 192, 209, 248, 279, 293, 317, 320, 342–344, 348, 349, 369, 374, 409, 412, 417, 484, 518, 531, 533, 547, 565, 597, 607, 633, 670, 696, 704, 708, 715, 730, 837, 878  
 European Commission List II, 533  
 Europium-152, 723  
 Experimental allergic encephalomyelitis, 863

### F

Fairborn, Ohio, 117  
 Fal estuary, England, 855  
 Falling Creek, Virginia, 374  
 Famaphos, 281  
 Famfos, 281  
 Famophos, 281  
 Famoxon, 280–284, 287–291  
 Famphos, 281  
 Famphur, 279–291  
     accumulation, 279  
     carcinogenicity, 288–291  
     criteria  
         human health, 289, 290  
         natural resources, 289–291  
     effects  
         aquatic organisms, 285, 286, 290, 291  
         birds, 279, 280, 283, 286–291  
         mammals, 279, 280, 282, 283, 285, 288–290  
         terrestrial invertebrates, 283  
     measurement, 280  
     metabolism, 280–283  
     persistence, 279, 281, 284, 290  
     properties, 281, 283  
     recommendations, 289–291  
     uses, 279, 280  
 Fanfos, 281  
 Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), 785  
 Fenbutatin oxide, 824  
 Fendeet, 308  
 Fenkill, 295  
 Fenoprop, 262  
 Fenpropathrion, 293  
 Fenvalerate, 293–311  
     accumulation, 304  
     carcinogenicity, 301, 302



*General Index*

- criteria  
 human health protection, 309–311  
 natural resources protection, 310
- effects  
 aquatic organisms, 304–306  
 birds, 306, 307  
 mammals, 307, 308  
 terrestrial invertebrates, 303, 304  
 terrestrial plants, 303, 304  
 metabolism, 300, 301  
 mode of action, 299–302  
 mutagenicity, 301, 302  
 properties, 294–296, 298, 300, 311  
 recommendations, 308–311  
 sodium channel gating, 299  
 teratogenicity, 301, 302  
 uses, 294, 295, 297
- Ferriamicide, 515  
 Ferric chloride, 608  
 Ferric sulfate, 542  
 Ferrihemoglobin cyanide, 209  
 Ferrimolybdate, 518  
 Ferritin, 166, 847  
 Ferrochelataase, 377  
 Ferrochrome lignosulfonate, 150  
 Ferrous chloride, 515  
 Ferrous sulfate, 542  
 Fezudin, 234  
 Fibronectin, 577  
 Fiji, 330  
 Finland, 73, 118, 126, 284, 404, 414, 426, 468, 484, 490, 495, 535, 632, 691, 697, 704, 705, 741, 829  
 Fish consumption advisories, 408, 409, 432, 434  
 Fission, 452, 677, 680, 685–687, 715, 722, 723, 733  
 Flavones, 669  
 Florida, 13, 33, 89, 102, 116, 129, 140, 157–159, 162, 178, 191, 192, 195, 284, 379, 390, 408, 415, 427, 434, 435, 440, 442, 443, 490, 499, 503, 510, 513, 604, 625, 640, 650, 669, 685, 690, 737, 878  
 Florida Department of Health, 408, 434  
 Florida Everglades, 408, 412, 414, 415, 429, 433, 434, 435, 494, 499, 511, 737  
 Fluoranthene, 648, 650, 652, 656, 660, 662–664, 666, 668–672  
 Fluorene, 631, 647, 648, 650, 655, 657, 658, 661–666, 670–672  
 Fluorides, 69, 176, 520, 783, 789, 792, 796, 811, 850  
 Fluorine, 293, 793, 796  
 Fluoroacetates, 783, 787, 798, 806  
 Fluoroacetic acid, 783, 789, 796  
 Fluoroacetyl coenzyme A, 792  
 Fluorocarboxylic acid, 792  
 Fluorocitrate, 783, 788, 789, 792, 793, 794, 795, 796, 798, 799, 807  
 Fluorocitric acid, 792  
 Fluorosis, 66, 69, 75  
 Fluorotricarboxylic acid, 792  
 FMC 10242, 96  
 Folsom-Natomas region, California, 473  
 Formaldehyde, 6, 12, 327, 341  
 Formaldoxime, 205  
 Formamide, 11, 212, 216  
 FP Tracerite yellow, 211  
 Former Soviet Union, 13, 73, 126, 137, 157, 175, 192, 314, 366, 368, 409, 484, 492, 497, 530, 531, 535, 567, 677, 683, 688, 691, 693, 696, 697, 757, 762, 780, 814, 825, 830, 842  
 Formic acid, 206  
*N*-Formylglycine, 579  
 Fort Edward, New York, 622  
 Foundry Cove, New York, 86  
 Fox River, Illinois, 663  
 France, 17, 20, 164, 177, 208, 211, 232, 304, 345, 384, 415, 429, 589, 658, 677, 683, 687, 739, 809, 810, 814, 816, 827, 829, 867  
 Francium-223, 682  
 Fratol, 789  
 Free cyanide, 203–206, 210, 211, 213, 215, 216, 218–221, 223, 227, 228, 230–232, 353, 356–359, 362, 370  
 French Guiana, 318  
 Fructose, 70, 209, 456, 547  
 Fructose-1,6-biphosphate aldolase A, 547  
 Fuller's earth, 577  
 Fulminating gold, 326  
 Furadan, 96, 102, 108  
 Furadan 3G, 108  
 Furadan 4-flowable, 103  
 Fusion, 646, 686, 733
- G**  
 G-24480, 234  
 Gabon, 318, 345  
 Galena, 373  
 Galveston Bay, Texas, 625, 769  
 Gamma globulin, 288  
 Gamma rays, 679, 680, 713, 733–735  
 Gardentox, 234  
 Garimpo, 476, 481  
 GC 1283, 503  
 Giese salt, 706  
 Genesee River, New York, 769  
 Genetically significant dose, 733  
 Geniphen, 830

## General Index

- Georges Bank, 630, 650  
 Georges River, New South Wales, 177  
 Georgia, 287, 318, 429, 466, 483, 503, 510, 626, 645, 690  
 Germanium, 7, 748  
 Germany, 45, 77, 81, 137, 201, 208, 214, 232, 268, 374, 403, 404, 428, 475, 484, 490, 495, 498, 543, 567, 595, 633, 643, 697, 704, 707, 780, 783, 814, 834, 839, 878  
 Ghana, 316, 318, 345, 407  
 Gliflor, 807  
 2-(*Beta-D*-Glucopyranosyloxy)-isobutyronitrile, 224  
 Glucose, 68, 123, 132, 138, 141, 146, 147, 245, 252, 335, 336, 376, 377, 456, 507, 543, 554, 557, 558, 562, 581, 582, 792, 793, 823, 862  
 Glucose phosphatase isomerase, 132  
 Glucose-1-phosphate, 66, 104  
 Glucose-6-phosphate dehydrogenase, 67, 168, 555  
*Beta* Glucosidase, 217, 226, 227  
 Glucosides, 659  
 Glucuronic acid, 114, 247, 307, 654  
 Glucuronides, 307, 611  
 Glutamate, 578, 865  
 Glutamate dehydrogenase, 578  
 Glutamic acid, 463  
 Glutamic oxalacetate transaminase, 392  
 Glutamic oxaloacetic transaminase, 63, 169, 191, 197, 578  
 Glutaraldehyde, 3  
 Glutathione, 5, 6, 12, 47, 54, 55, 85, 141, 168, 169, 186, 190, 199, 328, 377, 418, 435, 461, 463–465, 476, 482, 499, 576, 577, 611, 654, 744, 752, 753, 768, 792, 793  
 Glutathione peroxidase, 264, 425, 576, 577, 582, 743, 752, 851  
 Glutathione reductase, 576, 581  
 Glutathione S-transferase, 47, 240, 258, 562, 637, 653  
 Glyceraldehyde, 4, 5  
 Glycerol, 1, 2, 574, 844  
 Glycerol monoacetate, 789, 793–795, 806  
*Alpha* Glycerophosphate dehydrogenase, 392  
 Glycidaldehyde, 4–7, 11  
 Glycidol, 6  
 Glycine, 171, 212, 216, 247, 252, 257, 328, 332, 340, 456, 865  
 Glycogen, 82, 147, 206, 223, 305, 335, 507, 554, 557, 562, 657, 774, 865, 869, 872  
 Glyoxylate, 212  
 Gold, 313–370  
     allergic contact dermatitis, 348, 349, 367, 370  
     alloys, 320, 321, 324, 325, 335, 349, 350  
     bioaccumulation, 332  
     carcinogenicity, 350  
     concentrations  
         in abiotic materials, 330, 331, 352, 366, 368  
         in biota, 352, 368  
     drugs, 322, 323, 326–329, 337, 338, 348, 367, 369  
     effects  
         aquatic organisms, 333, 334  
         mammals, 334–339  
     elemental gold, 326, 341, 350, 368  
     extraction  
         with cyanide, 358, 360, 367, 368, 370  
         with mercury, 352–353  
     geology, 314–316  
     health risks to miners, 342–348  
     human sensitivity, 348–351  
     hyperphagia, 324, 335  
     interactions, 358  
     measurements, 369  
     metabolism, 326–328, 335, 336, 338, 355–357, 359, 361, 362, 369  
     mine wastes, 330, 356, 367  
     monovalent gold, 333, 335–338  
     production, 314–320  
     properties, 324–329, 366, 367–369  
     sources, 314–320  
     recommendations, 365–368  
     teratogenicity, 350  
     trivalent gold, 333, 334, 338, 339, 350  
     uses, 320–325, 368  
 Gold-198, 338  
 Gold bromide, 322, 326  
 Gold chloroquine, 322  
 Gold cyanide, 322, 340, 342  
 Gold-L-cysteine, 338  
 Gold disodium thiomalate, 328  
 Gold mine tailings ponds, 221, 354, 360  
 Gold rushes, 314, 473  
 Gold sodium thiomalate, 323, 333, 334, 336–339, 348–351  
 Gold thioglucose, 324, 335, 369  
 Golden fleece, 313  
 Gramonol, 576  
 Gramoxone, 574, 576  
 Gramuron, 576  
 Grasslands Water District, California, 742  
 Gray, 120, 151, 461, 466, 551, 592, 692, 704, 788, 803, 875  
 Great Barrier Reef, Australia, 656  
 Great Britain, 632, 688, 707  
 Great Lakes, 47, 48, 111, 117, 118, 121, 158, 162, 192, 227, 261, 262, 265–267, 381, 382, 397, 411, 485, 503, 511–514, 516, 564, 618, 626, 627, 630, 633, 641–643, 662, 685, 688, 691, 715, 726, 755, 827, 829, 832, 840, 879  
 Greece, 29, 355, 384, 535, 697, 704, 705, 709

*General Index*

Green Bay, Wisconsin, 265, 266  
 Greenland, 175, 383, 439, 443, 633, 688, 689, 832  
 Green River, Utah, 737, 746  
 Group D compounds, 288, 605  
 Group of Seven, 696  
 Guaiacols, 593  
 Guanine, 653  
 Guatemala, 407, 535  
 Gulf of Mexico, 111, 116, 626, 627, 771, 816  
 Gulf of St. Lawrence, 659  
 Guyana, 201, 354, 356, 416

**H**

Hackensack River, New Jersey, 552  
 Hamilton Harbor, Ontario, 552  
 Hanford, Washington, 689, 691, 718  
 Harbor Falls, New York, 622  
 Hattiesburg, Mississippi, 597  
 Hawaii, 25, 108, 111, 117, 118, 177, 385, 431, 742  
 HCS 3260, 113  
 Heap leaching, 209, 210, 353, 354, 359, 370  
 Helena, Arkansas, 117, 628  
 Helsinki Convention, 809  
 Helsinki, Finland, 620  
 Hemocyanin, 161, 166, 176, 177  
 Hemoglobin, 36, 84, 181, 182, 190, 198, 199, 205, 207–209, 231, 255, 259, 288, 356, 376, 377, 386, 460, 461, 507, 539, 542, 555, 562, 563, 743, 747, 772, 776, 810, 819  
 Hemorrhagic fever, 345  
 Heptachlor, 95, 112, 113, 114, 121, 123, 124, 125, 127, 509  
 Heptachlor epoxide, 112, 113, 114, 119, 121, 122, 124, 125  
 Heptachlorinated dibenzodioxins, 599  
 Heptachlorinated diphenyl ethers, 599  
 Heptachlorobiphenyls, 611  
 1,2,3,4,6,7,8-Heptachlorodibenzodioxin, 263  
 Heptachlorodibenzofurans, 595  
 Heptachlorophenoxyphenols, 593  
 Herbaxon, 576  
 Herboxone, 576  
 Hersey River, Michigan, 658  
 Hertz, 6, 773  
 Hexachlorinated dibenzodioxins, 595  
 Hexachlorobenzene, 504, 590, 593, 595, 596, 598, 601, 606, 631  
 2,2',4,4',5,5'-Hexachlorobiphenyl, 610  
 2,3,3',4,4',5'-Hexachlorobiphenyl, 610  
 2,2',3,3',6,6'-Hexachlorobiphenyl, 610  
 2,2',4,4',6,6'-Hexachlorobiphenyl, 610  
 2,2',4,4',5,5'-Hexachlorobiphenyl, 610, 611  
 3,3',4,4',5,5'-Hexachlorobiphenyl, 611  
 Hexachlorobiphenyls, 610, 621, 627, 630, 636

Hexachlorocyclopentadiene, 112, 113, 504  
 1,2,3,4,7,8-Hexachlorodibenzodioxin, 263  
 1,2,3,6,7,8-Hexachlorodibenzodioxin, 263, 267, 271  
 1,2,3,7,8,9-Hexachlorodibenzodioxin, 263, 271, 590  
 Hexachlorodibenzodioxins, 593  
 Hexachlorodibenzofurans, 595  
 Hexachlorophene, 262, 266, 277  
 4,5,6,7,8,8-Hexachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene, 112  
 Hexafluron, 251  
 1,2,6-Hexane thiol, 3  
 Hexavalent chromium, 137–147, 150–153, 156, 157, 449, 525  
 4-Hexyl-resorcinol, 4  
 Hippocrates, 19  
 Hiroshima, Japan, 677  
 Histidine, 209, 212, 328, 332, 340, 538, 557, 768, 846, 859  
 HIV 323, 327, 329, 346–348, 368, 369  
 Hong Kong, 37, 41, 313, 521  
 Hudson-Raritan estuary, 623  
 Hudson River, New York, 551, 621–623, 629, 664, 688  
 Huilex, 830  
 Humboldt Bay, California, 690  
 Humboldt River, Nevada, 363–365  
 Hungary, 13, 229, 356, 409, 517, 697, 829  
 Hyakkon Drainage Outlet, 467  
 Hyaluronic acid, 247  
 Hydantoin, 212  
 Hydantonic acid, 212  
*Hydrargyrum*, 407  
 3-Hydro-carbofuran-7-phenol, 98  
 Hydrochromates, 139, 142  
 Hydrocyanic acid, 202–204, 214, 219  
 Hydrogenases, 554  
 Hydrogen-3, 726, 728  
 Hydrogen cyanide, 201, 203–206, 210–214, 224, 226, 231, 354, 356, 358  
 Hydrogen fluoride, 789, 796  
 Hydrogen peroxide, 172, 221, 264, 326, 328, 538, 546, 557, 575–578, 588  
 Hydrogen selenide, 738  
 Hydrogen sulfide, 22  
 Hydrolases, 62, 472  
 Hydroperoxidases, 220  
*Beta*-Hydropropionaldehyde, 5  
 Hydroquinone, 4  
 Hydroxocobalamin, 14, 206, 209  
 Hydroxyanisole, 669  
 3-Hydroxyanthronilic acid, 239  
 Hydroxyatrazine, 46–50, 52–55  
*p*-Hydroxybenzenesulfonic acid, 281  
 3-Hydroxy-benzo(a)pyrene, 654

## General Index

- 9-Hydroxy-benzo(a)pyrene, 654  
 4-Hydroxybiphenyl, 638  
 3-Hydroxycarbofuran, 97, 98, 103, 105, 107, 108  
 3-Hydroxycarbofuranphenol, 105  
 3-Hydroxycarbofuran-7-phenol, 107  
 3-Hydroxychlordane, 114  
 Hydroxychlordane, 124  
 4-Hydroxy 2-chlorobiphenyl, 638  
 4-Hydroxy 4'-chlorobiphenyl, 638  
 Hydroxycobalamin, 224  
 Hydroxy diazinon, 240  
 20-Hydroxyecdysone, 251  
 1-Hydroxy, 2,3-epoxy chlordane, 124  
 2-Hydroxy-4-ethylamino-6-isopropylamino-  
     s-triazine, 46  
 Hydroxyethylenediamine triacetic acid, 542  
 4-Hydroxyfenvalerate, 306  
*N*-Hydroxymethyl carbofuran, 98  
 Hydroxymonomethoxytetrachlorobenzenes, 596  
 3-Hydroxy-*N*-hydroxymethyl carbofuran, 98  
 3-Hydroxynitrosocarbofuran, 107  
 3-(4'-Hydroxyphenoxy) benzoic acid, 307  
 3-4'(Hydroxyphenoxy) benzyl alcohol, 307  
 Hydroxy-4-picolinic acid, 579  
 Beta-Hydroxypropionaldehyde, 5  
 3-Hydroxypropylmercapturic acid, 12  
 1-Hydroxypyrene, 669  
 4-Hydroxy 3,5,4'-trichlorobiphenyl, 638  
 Hyperion sewer outfall, Los Angeles, 426, 443
- I**
- Idaho, 320, 373, 385, 393, 518, 692, 718, 762,  
     769, 836  
 Illinois, 48, 89, 116, 117, 192, 211, 373, 397, 427,  
     489, 492, 621, 663, 878  
 Illinois River, 117, 628  
 Ilsemannite, 518  
 Indeno(1,2,3-cd)pyrene, 649, 655, 664, 671, 672  
 India, 17, 28, 120, 130, 143, 203, 223, 317, 322,  
     341, 372, 402, 411, 426, 439, 440, 443,  
     485, 523, 677, 696  
 Indian Ocean, 223  
 Indiana, 78, 116, 137, 669  
 Indium, 87, 324, 334  
 Indoleacetonitrile, 213  
 Imidazole, 212, 847  
 2-Imidazolidinone, 212  
 2-Iminothiazolidene-4-carboxylic acid, 206  
 Imposax, 819, 820  
 Indoleacetic acid, 66  
 Indonesia, 316, 474, 535, 589, 814, 820  
 Infectious pododermatitis, 850  
 International Agency for Research on Cancer, 11,  
     271, 343, 593
- International Joint Commission of the United  
     States and Canada, 839  
 Inuit, 439, 440, 466  
 Invertebrates, terrestrial  
     acrolein, 7, 8  
     arsenic, 29–31  
     atrazine, 49–51  
     boron, 67  
     cadmium, 84, 85  
     carbofuran, 101, 104  
     chlordane, 120, 121  
     chlorpyrifos, 134  
     chromium, 143  
     copper, 175, 180, 183, 184, 194  
     cyanide, 215–217  
     diazinon, 237, 240, 241  
     diflubenzuron, 250, 251  
     dioxins, 268  
     famphur, 283  
     fenvalerate, 303, 304  
     lead, 382, 388, 389  
     mercury, 430, 445, 450, 451  
     molybdenum, 523, 529  
     nickel, 550, 551, 556, 557  
     paraquat, 580–582  
     pentachlorophenol, 596, 597  
     radiation, 694, 713, 714  
     selenium, 751, 752  
     sodium monofluoroacetate, 795–797  
     tin, 824  
     toxaphene, 829, 833, 837  
     zinc, 854, 855, 865, 866, 878  
 Iodine, 207, 223, 224, 231, 326, 541, 562, 704, 763  
 Iodine-125, 728, 731  
 Iodine-129, 692, 727, 728, 731  
 Iodine-130, 685  
 Iodine-131, 685, 697, 698, 709, 716, 728, 731  
 Iowa, 48, 116, 288, 484, 492  
 Iran, 841, 862  
 Irapuato, Mexico, 737  
 Iraq, 117, 407, 408  
 Ireland, 74, 202, 385, 517, 632  
 Iron, 2, 8, 24, 29, 30, 83, 84, 138, 139, 149, 166,  
     169, 170, 181, 189, 191, 196, 197, 201,  
     205, 215, 216, 264, 314, 315, 321, 324,  
     326, 327, 331, 332, 339–341, 349, 351,  
     361, 366, 368, 375, 377, 378, 383, 385,  
     392, 404, 414, 428, 433, 434, 450, 518,  
     520, 522, 533, 541, 542, 549, 550, 554,  
     555, 577, 608, 647, 675, 737, 743, 764,  
     770, 776, 842, 845, 847, 849, 850, 865,  
     868, 874, 886, 887  
 Iron-55, 686, 691, 693, 696, 716, 722  
 Iron-59, 686  
 Iron cyanide, 215  
 Iron oxide, 18, 22, 62, 335, 381, 414, 770, 771

*General Index*

Iron pyrites, 314  
 Isocitrate, 792  
 L-Isoleucine, 463  
 Isomerases, 62  
*Alpha*-Isopropyl phenylacetate ester, 294  
 Israel, 61, 130, 490, 697  
 Italy, 261, 267, 271, 274, 318, 372, 384, 387, 404, 409, 427, 443, 473, 490, 497, 585, 697, 704, 709, 725, 814, 829

**J**

Jamaica, 427  
 Japan, 126  
 JASAD Merrillite, 843  
 J protease, 850  
 Jefferson City, Montana, 356  
 Jordisite, 518

**K**

Kainic acid, 300  
 Kadethrin, 299  
 Kagoshima Prefecture, Japan, 469  
 Kanechlor, 619  
 Kansas, 95, 97, 105, 117, 157, 196, 225, 401, 488, 669  
 Kansas City, 117  
 Kansas River, 117  
 Kaolin, 224, 318, 334  
 Kaolinite, 149, 185, 578  
 Kayazinon, 234  
 Kayazol, 234  
 Kazakhstan, 317  
 Kelly Lake, 25  
 Kelocyanor, 208  
 Kentucky, 137, 155, 515  
 Kenya, 65, 318, 345, 411, 440, 744  
 Kepone, 504  
 Kerala, India, 341  
 Kern County California, 9, 203  
 Kerosene, 129, 591, 789  
 Kesterson National Wildlife Refuge, 64, 65, 743  
 Kesterson Reservoir, 743, 752  
 4-Ketobenztriazine, 221  
 3-Ketocarbofuran, 97, 98, 105, 107, 108  
 3-Ketocarbofuran phenol, 97, 98, 108  
 Key Largo, Florida, 116  
 Kiev, Ukraine, 699, 701, 703  
 Knox out, 234  
 Korea, 352, 443, 471, 518, 688  
 Kosmos 954, 685  
 Krakatoa volcano, 427  
 Krebs cycle, 792, 793, 805

Kruger National Park, 179  
 Krypton-85, 685, 697, 728  
 Kumamoto Prefecture, Japan, 468, 469  
 Kuwait, 697  
*L*-Kynurenine, 239  
 Kypclor, 113  
 Kyrgyzstan, 354  
 Kyushu, Japan, 466

**L**

L15, 843  
 Labrador, 434, 658  
 Lactate, 206, 225  
 Lactic acid, 223, 350, 557, 793  
 Lactic dehydrogenase, 190, 191, 578, 845, 861  
 Laetrile, 202, 211, 212, 226  
 Laguna Madre, Texas, 833  
 Lahontan Reservoir, Nevada, 429, 430, 474, 475, 482  
 Lake Baikal, Russia, 832  
 Lake Chad, Africa, 433  
 Lake Champlain, 635  
 Lake Clear, Ontario, 628  
 Lake Erie, 48, 162, 621, 656, 675  
 Lake Geneva, Switzerland, 629  
 Lake Hartwell, South Carolina, 623  
 Lake Huron, 266, 512, 832  
 Lake Mendota, Wisconsin, 163  
 Lake Michigan, 26, 158, 162, 614, 621, 627, 656, 716, 762, 832, 834  
 Lake Monova, Wisconsin, 163  
 Lake Nieuwe Meer, 626  
 Lake Ontario, 162, 261, 265–267, 503, 504, 511–513, 515, 516, 621, 627, 643  
 Lake Paijanne, Finland, 705  
 Lake St. Clair, Canada, 382, 408, 471, 499, 625  
 Lake Superior, 265, 266, 627  
 Lake Washington, 25  
 Lannate, 241  
 Lanthanum-140, 698  
 Lapland, 691, 706  
 Largon, 246  
 Lasso, 46  
 Laterite, 535  
 Latvia, 354  
 Lauxtol A, 592  
 Lawrence, Kansas, 117  
 Lead, 371–406  
     bioaccumulation, 388–391, 393, 405  
     carcinogenicity, 371  
     chemical properties, 374–376  
     concentrations  
         abiotic materials, 379–381  
         biota, 382, 383

## General Index

---

- Lead (cont'd)  
 criteria  
   human health, 396–403  
   natural resources, 396–403  
 effects, 387–396  
 food chain transfer, 391  
 mode of action, 376–379  
 mutagenicity, 371, 395  
 persistence, 376, 378  
 photochemical degradation, 375  
 sources, 373, 374  
 teratogenicity, 371, 395  
 transformations, 392  
 uses, 373, 374  
 Lead-206, 375  
 Lead-207, 375  
 Lead-210, 375  
 Lead-211, 682  
 Lead-212, 375  
 Lead-214, 682  
 Lead acetate, 375, 377, 378, 460  
 Lead arsenate, 18–21, 30, 379, 380, 382, 393, 396, 401, 405  
 Lead carbonate, 375  
 Lead chloride, 375  
 Lead encephalopathy, 373, 378, 395  
 Lead hydroxide, 375  
 Lead nitrate, 375, 379  
 Lead oxide, 375, 382, 389  
 Lead phosphate, 373  
 Lead sulfate, 375  
 Lead sulfide, 375  
 Leber's hereditary optic atrophy, 207  
 Lehigh Gap, Pennsylvania, 841  
 Lesotho, 347  
 Lethal Trait A46, 853, 863  
 Lewes, Delaware, 287  
 Lewisite, 19  
 Liadong-Koren peninsula, 317  
 Liberia, 318  
 Liborius, 842  
 Limonite, 314  
 Linamarase, 224  
 Linamarin, 212, 213, 217, 223, 224  
 Lindane, 595, 829  
 Linear energy transfer, 680, 712, 734, 735  
 Linear hypothesis, 734  
 Lipxygenase, 216  
 Lister's antiseptic, 410  
 Loch Lomond, 25  
 London, England, 321, 645, 709  
 Loma, Colorado, 769  
 Long Beach, California, 629  
 Long Island, New York, 386, 461  
 Long Island Sound, 622, 623, 627  
 Long Island and New Jersey Coastal Drainage, 481  
 Lorsban, 129, 130, 134  
 Los Angeles, California, 2, 426, 443, 629  
 Lotaustralin, 213  
 Louisiana, 1, 178, 404, 503, 513, 833, 834  
 Lysine, 865  
 Lynch's River, South Carolina, 356  
 Lysine, 865
- M**
- M-44 sodium cyanide capsules, 230  
 M 140, 113  
 M 410, 113  
 Alpha-2-Macroglobulin, 846  
 Mad Hatter syndrome, 410, 422  
 Madeira River, Brazil, 475, 477, 478  
 Magnacide H, 3  
 Magnesium oxide, 434, 517  
 Magnesium sulfate, 123, 794  
 Magnetite, 314, 316  
 Maine, 37, 157, 265, 275, 277, 384, 434, 440, 484, 492, 514, 603, 641, 656, 670, 843  
 Magnesium, 37, 62, 123, 171, 176, 181, 252, 266, 331, 332, 334, 378, 414, 433, 450, 506, 518, 541, 542, 545, 556, 557, 563, 794, 850, 865, 868  
 Magnesium acetate, 545  
 Maguey, 65  
 Malachite, 162  
 Malagasy Republic, 318  
 Malathion, 807  
 Malaysia, 196, 352, 443, 489, 492, 814  
 Malawi, 345  
 Malayaite, 813  
 Malaysia, 196, 352, 443, 489, 492, 814  
 Mali, 318  
 Malic acid, 579  
 Malonitrile, 226  
 Mammals  
   acrolein, 5–7, 10, 11, 115  
   arsenic, 23, 27–29, 34–36, 42  
   atrazine, 54, 55, 57  
   boron, 62, 65, 69, 70, 75  
   cadmium, 80, 82, 84, 85, 90, 93  
   carbofuran, 96, 97, 99, 101–103, 106, 108, 109  
   chlordan, 114, 115, 119, 120, 123, 124, 126–128  
   chlorpyrifos, 131–134, 136  
   chromium, 138, 141, 143, 144, 147, 152, 154–156, 159  
   copper, 161, 163, 164, 167–169, 171–174, 176–181, 183, 189, 190, 197–200  
   cyanide, 202, 203, 206, 207, 211, 215, 219, 222, 225, 226, 231, 232  
   diazinon, 233, 235, 237–243  
   diflubenzuron, 245, 250, 255–257

*General Index*

- dioxins, 264, 269, 271–275, 277, 278  
 famphur, 279, 280, 282, 283, 285, 288–290  
 fenvalerate, 293, 294, 298, 299, 301–304, 307, 308, 310, 311  
 gold, 333, 334, 353, 355, 358–363, 367, 369  
 lead, 377, 378, 383, 386–388, 392–395, 400  
 mercury, 416–418, 425, 428, 429, 431, 439–442, 446–449, 453, 456, 462, 464–466, 478, 484, 487, 493–495, 497, 499–501  
 mirex, 503–508, 510, 511, 514, 515  
 molybdenum, 522, 525, 526, 530, 532  
 nickel, 533, 537, 540, 542–544, 552–562, 566, 567, 569–571  
 paraquat, 573, 575, 580, 581, 584–588  
 pentachlorophenol, 591, 599–602, 605, 606  
 polychlorinated biphenyls, 612–614, 620, 623, 624, 632, 634–640, 643  
 polycyclic aromatic hydrocarbons, 653, 658, 663, 665–667, 673, 675  
 radiation, 691, 700, 701, 704, 710–713, 717–720, 722, 731  
 selenium, 738, 739, 742, 744, 745, 747–749, 751–753, 756, 758, 759  
 silver, 761, 764, 767, 768, 770, 772, 774, 776, 781, 782  
 sodium monofluoroacetate, 784, 785, 787–789, 792, 793, 795, 796, 798, 801–807  
 tin, 810, 812, 813, 817, 819, 822–824, 827  
 toxaphene, 829, 833–835, 840  
 zinc, 843, 845–847, 851, 853, 858, 859, 861, 862, 875, 876, 881, 886–889  
 Mandelonitrile, 217  
 Manganite, 211  
 Manganese, 22, 66, 162, 169, 170, 176, 330, 332, 351, 352, 375, 388, 414, 444, 450, 520, 522, 523, 541, 542, 545, 563, 577, 770, 771, 844, 845  
 Manganese-54, 686, 690, 693–696, 722  
 Manganese dioxide, 765  
 Manganese oxides, 22, 549, 550, 845  
 Manitoba, 317, 434, 514, 535  
 Mannosidase, 861  
 Manoa Stream, Hawaii, 117  
 Mantakassa disease, 224  
 Marseilles, France, 429  
 Marshall Islands, 677, 720  
 Maryland, 26, 45, 47–49, 51, 89, 96, 102, 106, 111, 157, 177, 192, 245, 551, 565, 774, 814, 833, 839, 878  
 Mass number, 325, 518, 519, 678–680, 733–735  
 Massachusetts, 2, 89, 150, 192, 195, 266, 401, 409, 471, 565, 625, 628, 634, 658, 815, 878  
 Mato Grosso, Brazil, 479  
 Maxolon, 804  
 McMurdo Base, Ross Island, Antarctica, 620  
 Medicine Bow, Wyoming, 737  
 Mediterranean Sea, 170, 574, 624  
 Melanin, 68, 166, 582–584, 661  
 Menkes' syndrome, 167  
 2-Mercaptoethanol, 6  
*Gamma*-Mercaptopropionylglycine, 6  
*Beta*-Mercaptopyruvate cyanide sulfurtransferase, 206  
 3-Mercaptopyruvate sulfurtransferase, 221, 360  
 Mercapturic acids, 12  
 Mercuric nitrate, 410, 422  
 Mercuric oxide, 415  
 Mercuric reductase, 416, 450, 471, 472, 497  
 Mercuric selenide, 418, 425, 441  
 Mercuric sulfide, 407, 409, 426, 427  
 Mercurochrome, 410  
 Mercurous ion, 415  
 Mercurio zinc cyanide, 410  
 Mercury, 407–501  
     carcinogenicity, 447, 448  
     concentrations in  
         abiotic materials, 425–428, 477–480  
         biota, 477–480  
     criteria  
         human health, 484–492  
         natural resources, 484–492  
     effects  
         lethal, 443–447  
         sublethal, 447–466  
     genotoxicity, 447, 448  
     hazards from gold mining  
         Brazil, 475–481  
         United States, 481–483  
     measurement, 421, 425, 496, 497  
     mitigation, 471, 480, 500  
     poisoning and treatment, 421–425  
     poisoning case histories  
         Iraq, 407, 408  
         Minamata, Japan, 430, 442, 446, 461, 463  
     properties, 415–421  
     sources, 409, 411–415  
     speciation, 419–421  
     teratogenicity, 448, 449  
     transformations, 412  
     transport, 419–421  
     uses, 409–411  
 Mercury-203, 453  
 Mercury-206, 682  
 Merrymeeting Bay, Maine, 384  
 Mersey estuary, England, 394  
 Merthiolate, 411  
 Metal fume fever, 842, 876  
 Metallothioneins, 81, 82, 85, 86, 167, 169, 185, 188, 199, 328, 338, 339, 393, 417, 418, 425, 429, 455, 456, 463, 493, 766, 768, 843, 846, 847, 873, 887

## General Index

---

- Methane, 203, 470, 472, 594, 619  
Methanearsonic acid, 21  
Methanol, 46, 130, 263, 295, 329, 339, 420, 576, 592  
Methemoglobin, 170, 190, 206, 208, 209, 220  
Methionine, 2, 3, 210, 339, 463, 465, 520, 748, 850, 865  
Methocarbamol, 308  
Methomyl, 786  
Methotrexate, 323  
Methoxychlor, 124  
2-Methoxy-3,4-dihydro-2PH-pyran, 12  
Methoxyethylmercurials, 447  
Methoxytrichloropyridine, 131  
Methylamine, 579  
Methylamine hydrochloride, 579  
Methylarsines, 20, 21  
Methylarsinic acid, 22  
Methylarsonate, 26  
Methylarsonic acid, 23, 25  
Methylarsonous acid, 23  
Methyl bromide, 515  
Methyl chloride, 575  
3-Methylcholanthrene, 256, 614, 649, 664, 665, 667–669, 674, 813  
20-Methylcholanthrene, 542, 545  
Methylcobalamin, 420, 449, 470, 811  
5-Methyl deoxycytidine, 675  
Methylene blue, 208  
Methylene dioxyphenyls, 235, 237  
Methyl fluoride, 790  
Methyl iodide, 811  
Methylmercurials, 417, 418, 423, 497–499  
Methyl methacrylate, 210  
S-Methyl-N-((methylcarbamoyl)oxy)-thioacetimidate, 241  
1-Methylnaphthalene, 662  
2-Methylnaphthalene, 661, 662  
Methyl parathion, 285  
1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), 583  
Methyl prednisolone, 577  
Methyl prostaglandins, 578  
4-Methylpyrazole, 793, 794, 806, 807  
*p*-(*N*-Methylsulfamoyl)phenol, 281, 282  
*p*-(*N*-Methylsulfamoyl)phenyl glucuronide, 282  
Methyltins, 811  
Methyl viologen, 576  
Metoclopramide, 804  
Mexico, 1, 65, 80, 111, 116, 137, 162, 211, 223, 297, 373, 374, 384, 404, 407, 411, 518, 573, 626, 627, 629, 677, 692, 737, 740, 762, 771, 785, 786, 816, 831, 842  
Mexico City, 141  
Michigan, 140, 162, 174, 265, 266, 512, 590, 620, 631, 633, 655, 658, 669, 786  
Microgold, 222, 472  
Micromercurialism, 422  
Micromite, 246  
Midland, Michigan, 265  
Midway Atoll, 372  
Migratory Bird Treaty Act, 360, 365  
Mill Reek, 374  
Miller Lake, Oregon, 831  
Minamata, Japan, 408, 430, 442, 446, 447, 461, 463  
Minamata Disease, 464, 467–471  
Minamata Disease Park, 472  
Minas Gerais, Brazil, 478, 481  
Minnesota, 89, 192, 196, 288, 385, 411, 428, 535, 565, 689, 756, 786, 878  
Miramichi River, Canada, 178  
Mirex, 503–516  
    bioaccumulation  
        aquatic organisms, 507, 508  
        birds, 508, 509  
        mammals, 508, 509  
    carcinogenicity, 506, 514, 516  
    case histories  
        Great Lakes, 511–513  
        southeastern United States, 509–511  
        USA except southeast, 513, 514  
    criteria  
        human health protection, 513–515  
        natural resources protection, 516  
    effects  
        lethal  
            aquatic organisms, 504, 505  
            birds, 505  
            mammals, 505  
        sublethal  
            aquatic organisms, 505, 506  
            birds, 506  
            mammals, 506, 507  
        persistence, 504, 509, 515, 516  
        properties, 503, 504  
        recommendations, 514–516  
        teratogenicity, 503, 516  
Mirex 4X, 509  
Mission, Texas, 833  
Mississippi, 111, 120, 429, 503, 510, 513, 597, 626, 627, 690, 770, 842  
Mississippi Flyway, 513  
Mississippi River, 78, 117, 118, 382, 626, 628, 741  
Mississippi River Valley, 211



*General Index*

- Missouri, 89, 158, 192, 211, 261, 266, 271, 274, 373, 374, 379, 427, 498, 517, 565, 627, 762, 839, 878
- Missouri Department of Health, 382
- Missouri River, 117, 118, 261
- Mitomycin, 449, 542
- Mixed function oxidase, 123, 235, 240, 256, 376, 507, 601, 636, 642, 653, 654, 657, 663–665, 667
- Mixed function oxygenase, 653, 662, 666, 813
- Mol, Belgium, 692
- Molybdates, 170
- Molybdenite, 518
- Molybdenosis, 517, 519–521, 526–528, 530
- Molybdenum, 517–532
- carcinogenicity, 522
  - concentrations in
    - abiotic materials, 518, 520–522
    - biota, 517, 521
  - criteria
    - human health protection, 529–531
    - natural resource protection, 529–531
  - deficiency, 517, 519, 520, 522, 523, 525–529, 531, 532
  - effects
    - aquatic organisms, 523–525
    - birds, 525
    - mammals, 525–528
    - terrestrial invertebrates, 523
    - terrestrial plants, 522, 523
  - environmental chemistry, 517–520
  - essentiality, 517, 518, 521–523, 525, 526, 528, 531
  - interactions, 518, 519
  - mode of action, 519, 520
  - properties, 518, 519
  - recommendations, 528–531
  - sources, 518
  - uses, 518
- Molybdenum-99, 697, 698
- Molybdenum dioxide, 482
- Molybdenum trioxide, 518
- Molybdic acid, 525
- Molybdoflavoproteins, 518
- Molybdoproteins, 520
- Mongolia, 17
- Monoacetin, 806
- Monobutyltins, 813
- Monochlorobiphenyls, 609
- 2-Monochlorobiphenyl, 609
- 4-Monochlorobiphenyl, 609
- Monochlorodihydrochlordene, 114
- Monocrotophos, 287
- Monofluoroacetic acid, 783, 791, 792, 796
- 8-Monohydro mirex, 504
- 10-Monohydro mirex, 504
- Monomethylarsonate, 26
- Monomethylarsonic acid, 21, 29
- Monomethyltins, 811
- Monoorganotins, 812
- Monosodium fluoroacetate, 789
- Monosodium methanearsonate, 36
- Montana, 1, 25, 157, 195, 320, 356, 361, 365, 373, 385, 488, 519, 603, 762, 785, 786, 855
- Montmorillonite, 578, 706
- Montreal, Canada, 549, 550
- Montreal River, Ontario, 352
- Morbillivirus, 624
- Morocco, 841
- Morsodren, 106
- Moto, 830
- Motox, 830
- Mount Olympus, Cyprus, 332
- Mount St. Helena, Washington, 427
- Mozambique, 224, 345, 347
- Mozambique Channel, 685
- Murray Brook, New Brunswick, 331
- Musty taint, 590
- Mutagenicity
  - acrolein, 7
  - arsenic, 28
  - atrazine, 54–56
  - boron, 60, 63, 75
  - cadmium, 87
  - carbofuran, 103, 107, 109
  - chlordane, 124
  - chlorpyrifos, 134
  - chromium, 145, 152, 153
  - copper, 172, 173, 197, 200
  - cyanide, 215
  - diazinon, 237, 242
  - diflubenzuron, 256
  - dioxins, 268
  - fenvalerate, 301, 302
  - lead, 371, 395
  - mercury, 447, 448
  - nickel, 542, 543, 546
  - paraquat, 581
  - pentachlorophenol, 593, 600, 606
  - polychlorinated biphenyls, 634
  - polycyclic aromatic hydrocarbons, 645, 659, 662–665, 668, 673–675
  - radiation, 707, 718, 721, 731
  - selenium, 749, 750
  - silver, 777
  - tin, 811
  - toxaphene, 836
  - zinc, 851, 852
- Myochrisin, 323

## General Index

### N

- NADPH-cytochrome reductase, 576  
 Nagasaki, Japan, 677, 687  
 Napoleon III, 211  
 Naphthacene, 648  
 Naphthalene, 646–648, 650–652, 656, 658, 661–663, 665, 671, 672, 675  
 Naphthene, 666  
 l-Naphthyl *N*-methylcarbamate, 241  
 Narragansett Bay, Rhode Island, 148, 650  
 Nassau County, New York, 140  
 National Cancer Institute, 252  
 National Institute for Minamata Disease, 472  
 Nebraska, 48, 129, 211, 373, 394  
 Neocidol, 234  
 Neodymium-147, 686  
 Neptunium-235, 716  
 Neptunium-237, 727  
 Neptunium-239, 697  
 Netherlands, 38, 89, 126, 137, 159, 192, 193, 214, 267, 384, 397, 404, 409, 446, 475, 484, 517, 564, 566, 569, 633, 642, 656, 658, 709, 839, 839, 878  
 Neuse River, North Carolina, 690  
 Neutron, 21, 60, 63, 64, 75, 325, 421, 678, 679, 685, 686, 692, 716, 733–735, 766  
 Nevada, 60, 74, 129, 195, 203, 222, 230, 314–316, 319, 320, 330, 353–355, 360–365, 368, 373, 412, 413, 428–430, 473, 474, 481, 482, 500, 518, 520, 692, 714, 742, 762, 784, 839  
 Nevada Division of Wildlife, 355  
 Newark Bay, New Jersey, 261, 426  
 New Bedford Acushnet estuary, 150  
 New Bedford Harbor, 625, 628, 634  
 New Caledonia, 535, 537, 543, 550  
 New England, 372, 499, 514, 627  
 Newfoundland, 641, 658, 833  
 New Guinea, 301, 330  
 New Hampshire, 149  
 New Jersey, 2, 60, 89, 137, 140, 159, 192, 261, 269, 386, 426, 443, 481, 484, 489, 492, 513, 514, 551, 552, 566, 623, 630, 691, 741, 762, 833, 878  
 New Lead Belt, 374  
 New Mexico, 80, 162, 211, 373, 374, 518, 677, 692, 785, 831  
 New Orleans, 153  
 New South Wales, Australia, 177, 803  
 New South Wales State Forest, 803  
 New wire disease, 874  
 New York, 13, 17, 20, 35, 86, 89, 111, 137, 140, 149, 150, 157, 159, 161, 163, 192, 195, 266, 276, 277, 386, 417, 428, 434, 440, 461, 488, 495, 501, 513–515, 551, 553, 566, 603, 604, 622, 623, 629, 641, 656, 664, 688, 691, 762, 769, 771, 838, 841, 842, 878  
 New York Bight, 149, 150, 622, 623, 771  
 New York City, 137, 163, 553  
 New York Harbor, 622  
 New Zealand, 37, 45, 174, 178, 225, 231, 330, 354, 491, 499, 517, 748, 784, 786–788, 790, 796, 797, 801, 805, 807  
 (Ni(H<sub>2</sub>O)<sub>6</sub>)<sup>2+</sup>, 537, 538, 570  
 Niacin, 577  
 Niagara NIA-10242, 96  
 Niagara River, New York, 265, 266, 511  
 Nicaraguan, 407  
 Nickel, 533–572  
     carcinogenicity, 538, 541–545, 547, 563  
     chronology, 534  
     concentrations  
         in abiotic materials, 549  
         in biota, 550  
     criteria  
         human health, 567, 570  
         natural resources, 564–567  
     deficiency, 534, 541, 546, 554, 555, 565, 566, 570, 571  
     effects, 534, 537, 541, 543, 545, 547, 551–571  
     interactions, 537, 541, 545, 546, 564  
     inventory, 548  
     metabolism, 538, 540, 541, 550, 554–556, 558, 560, 562, 564, 570  
     mutagenicity, 542, 543, 545–547  
     production, 535, 536, 538, 541, 544, 557, 561, 562, 566  
     properties, 537–539, 541, 557, 564  
     sources, 533–536, 538, 548–550, 552, 556, 570  
     teratogenicity, 542, 543, 545–547  
     uses, 534–536  
 Nickel-56, 537  
 Nickel-57, 537  
 Nickel-58, 537  
 Nickel-59, 537  
 Nickel-60, 537  
 Nickel-61, 537  
 Nickel-62, 537  
 Nickel-63, 537  
 Nickel-64, 537  
 Nickel-65, 537  
 Nickel-67, 537

*General Index*

- Nickel acetate, 536, 545, 547, 559, 561, 563  
 Nickel ammonium sulfate, 536, 545  
 Nickel antimonide, 545  
 Nickel arsenide, 545  
 Nickel bromide, 535  
 Nickel-cadmium battery plants, 548, 551, 552, 571  
 Nickel carbonate, 536, 538, 543, 545, 559, 560  
 Nickel carbonyl, 533, 534, 536–541, 543–546, 559, 560, 567–572, 660  
 Nickel chloride, 536, 538, 539, 542, 543, 545–547, 549, 560, 562, 563, 566  
 Nickel chloride hexahydrate, 538, 546  
 Nickel chromate, 545  
 Nickel cyanide, 358  
 Nickel dermatitis, 534, 561, 563  
 Nickel disodium EDTA, 559  
 Nickel fluoborate, 536  
 Nickel fluoride, 536, 545  
 Nickel hexahydrate, 561, 562  
 Nickel hydroxide, 536, 538, 545  
 Nickel-iron matte, 545  
 Nickel mesotetraphenylporphine, 547  
 Nickel monosulfide, 536, 545, 546  
 Nickel monoxide, 567  
 Nickel nitrate, 536, 538, 543, 546  
 Nickel oxides, 533, 543, 544  
 Nickel powder, 537, 544, 545, 560, 563, 569  
 Nickel selenide, 545  
 Nickel subsulfide, 533, 536, 540, 542–546, 560, 563, 566, 569  
 Nickel sulfamate, 536  
 Nickel sulfate, 220, 350, 358, 534, 536, 538–540, 543, 545–549, 559, 560, 563, 566, 850  
 Nickel sulfate hexahydrate, 538, 539, 559, 560, 563  
 Nickel sulfide, 538, 544, 852  
 Nickel telluride, 545  
 Nickemia, 563  
 Nickelocene, 536, 545  
 Nickeloplasmin, 537  
 Nicotinamide, 6, 68, 235, 576  
 Nicotinamide adenine dinucleotide phosphate (NADPH), 6, 576  
 Nicotine, 807  
 Nicotinic acid, 577  
 Nicotinic adenine nucleotide (NAD), 235  
 Nigeria, 224, 333  
 Nigerian nutritional neuropathy, 222  
 Nigrosine, 785  
 NiHPO<sub>4</sub>, 537, 538, 570  
 Niobium-95, 698, 723  
 Nipsan, 234  
 Niran, 113  
 Nitra River, Slovakia, 432  
 Nitrate reductase, 206, 522  
 Nitrile lyase, 217  
 Nitriles, 202–204, 209, 210, 216, 226, 231, 355, 361  
 Nitrioltriacetic acid, 171, 378  
 Nitrite reductase, 206  
 Nitrobenzene, 208  
*N*-[4-(5-Nitro-2-furyl)-2 thiazoyl] formamide, 11  
 Nitrogen, 12, 14, 57, 163, 165, 183, 202, 212, 215, 250, 293, 328, 354, 355, 433, 521–523, 524, 551, 554, 575, 622, 734, 743  
 Nitrogenase, 250, 522, 556  
 3-Nitro-4 hydroxyphenyl arsonic acid, 20, 34, 40, 42  
 4-Nitroquinoline-N-oxide, 851  
 Nitrosamines, 656  
 Nitrosated 3-hydroxycarbofuran, 107  
 Nitrosated 3-ketocarbofuran, 107  
*N*-Nitrosoatrazine, 55  
 Nitrosocarbofuran, 107  
*N*-Nitroso-*N*-methylurea, 526  
*N*-Nitrososarcosine ethyl ester, 526  
 Nome, Alaska, 483  
*Cis*-Nonachlor, 112, 117–119  
*Trans*-Nonachlor, 112, 114–118, 120, 123, 127  
 Nonachlorinated diphenyl ethers, 599  
 Nonachlorobiphenyls, 611  
 Nonachlorobornanes, 833  
 Nonachlorophenoxyphenols, 598  
 Nonachlors, 834  
 Norepinephrine, 300  
 North America, 38, 45, 56, 111, 137, 153, 179, 209, 255, 279, 313, 315, 342, 343, 348, 349, 353, 369, 372, 409, 411, 412, 471, 474, 482, 518, 547, 561, 597, 607, 706, 718, 725, 726, 740, 837  
 North Carolina, 13, 134, 137, 157, 318, 466, 503, 670, 690, 716, 737, 742, 749, 825  
 North Dakota, 13, 111, 157, 195, 488, 517  
 North Sea, 437, 656, 715  
 Northern Prairie wetland microcosm, 47  
 Northwest Territories, 25, 80, 514  
 Norway, 125, 174, 284, 337, 379, 391, 404, 430, 495, 498, 518, 521, 527, 535, 543, 552, 658, 697, 704, 706, 707, 708, 788, 805  
 Nova Linda, Brazil, 341  
 Nova Scotia, 225, 317, 384, 658  
 Nucidol, 234

## General Index

---

### O

Oak Ridge, Tennessee, 408, 692  
 Octachlor, 112, 113  
 Octachlor epoxide, 112  
 Octachlorinated dibenzodioxins, 599  
 Octachlorinated diphenyl ethers, 599  
 Octachlorobiphenyls, 611  
 Octachlorobornanes, 834  
 Octachlorocamphene, 830  
 Octachlorocyclopentene, 113  
 1,2,3,4,6,7,8,9-Octachlorodioxin, 263  
 Octachlorodioxins, 594  
 Octachloronaphthalenes, 612  
 Octachlorophenoxyphenols, 599  
 Octachlorostyrenes, 621  
 Octa-klor, 113  
*n*-Octanol, 263  
 Octanol/water partition coefficient,  
     130, 818  
 Octaterr, 113  
 Octyltins, 812  
 Ohio, 2, 8, 48, 116–118, 137, 614, 626–628, 655,  
     664, 672  
 Ohio River, 117, 614, 626, 628  
 Oklahoma, 60, 95, 492, 838  
 Old River, Louisiana, 117  
 Olmsted, Illinois, 628  
 Omaha, Nebraska, 394  
 OMS 1804, 246  
 Ontario, Canada, 25, 343, 352, 383, 414, 564, 655,  
     739, 878  
 Ontario Provincial Quality Guidelines, 352  
 Ontrack WE-1, 592  
 Optical isomers, 294, 311  
 Oregon, 60, 89, 268, 520, 566, 784, 810, 831  
 Organoarsenicals, 17, 19, 20, 23, 26, 29, 30, 32, 33,  
     35, 37, 41, 42  
 Organochromium compounds, 139, 145, 156  
 Organoleads, 375, 376  
 Organomercurial lyase, 416, 450, 471, 497  
 Organotins, 809–821, 823–828  
 Orthoarsenic acid, 21  
 Ortho-klor, 113  
 Ortho paraquat, 576  
 Orvar, 576  
 Oswego, New York, 513  
 Oswego River, 511  
 Ovine foot rot, 850  
 Oxalacetate, 392, 792  
 Oxalic acid, 579, 792  
 Oxazolone, 124  
 Oxford, Alabama, 784  
 Oxychlorane, 112–115, 117–128

### P

P4501A activity, 269, 615, 823  
 Pacific flyway, 718  
 Pacific Ocean, 330, 331, 419  
 Pacific Proving Grounds, 692, 693  
 PAHs, 542, 645–676  
 Pakistan, 233, 407, 677  
 Palestine Lake, Indiana, 78  
 Palladium, 321, 324, 325, 331, 332, 340,  
     349, 350  
 Palmerton, Pennsylvania, 84, 388, 389, 841,  
     854, 859  
 Palos Verde, California, 629  
 2-PAM, 239  
 Panama, 841  
 Pantanal, 478  
 Papite, 3  
 PAPP, 807  
 Papua New Guinea, 316  
 Paracol, 576  
 Paraguay, 478  
 Paralytic shellfish poisoning, 877  
 Paraoxon, 123  
 Paraquat, 573–588  
     carcinogenicity, 580  
     concentrations in field collections,  
         574, 575,  
     criteria  
         human health protection, 586, 587  
         natural resources protection,  
             586, 587  
     effects  
         aquatic organisms, 582, 583  
         birds, 583, 584  
         mammals, 584, 585  
         terrestrial invertebrates, 580–582  
         terrestrial plants, 580–582  
     environmental chemistry, 575  
     fate in soil and water, 578, 579  
     mode of action, 575, 576, 577, 578  
     mutagenicity, 581  
     persistence, 575, 579, 585  
     properties, 575  
     recommendations, 585–587  
     teratogenicity, 585  
     uses, 574  
 Paraquat CL, 576  
 Paraquat dichloride, 574–576, 578  
 Paraquat dimethylsulfate, 574  
 Parathion, 123  
 Paris Convention, 809  
 Paris Green, 164  
 Parkinson's Disease, 469, 573, 583  
 PASCO, 843  
 Pathclear, 576

*General Index*

- Patuxent Wildlife Research Center, 783  
 Payapal, Venezuela, 344  
 PCB 4, 609, 614, 637  
 PCB 8, 609, 642  
 PCB 15, 609, 617, 635, 642, 643  
 PCB 18, 609, 615, 641  
 PCB 24, 609, 618, 633  
 PCB 26, 609, 642  
 PCB 28, 609, 629  
 PCB 29, 609  
 PCB 31, 609  
 PCB 37, 642  
 PCB 44, 609, 621, 637  
 PCB 47, 609, 636, 639  
 PCB 49, 609  
 PCB 52, 609, 615  
 PCB 55, 609, 621  
 PCB 60, 609, 621  
 PCB 66, 609  
 PCB 70, 609, 629  
 PCB 74, 609  
 PCB 76, 609  
 PCB 77, 277, 610, 614, 625, 629, 632,  
     635–639  
 PCB 80, 610  
 PCB 81, 614  
 PCB 82, 610  
 PCB 84, 615  
 PCB 87, 610  
 PCB 91, 610  
 PCB 92, 610  
 PCB 95, 610, 642  
 PCB 97, 610  
 PCB 99, 610, 634, 637  
 PCB 101, 610, 629, 632, 639  
 PCB 105, 610, 614, 630, 632  
 PCB 107, 610  
 PCB 108, 610  
 PCB 110, 610, 615  
 PCB 114, 610, 614  
 PCB 118, 610, 614, 629, 632  
 PCB 123, 610, 614  
 PCB 126, 610, 614, 615, 624, 625, 629, 631–634,  
     636–638, 823  
 PCB 128, 610, 615, 617, 630, 636, 642  
 PCB 129, 610, 624  
 PCB 132, 610  
 PCB 136, 610  
 PCB 137, 610, 617  
 PCB 138, 610, 619, 629, 632, 639  
 PCB 144, 610  
 PCB 149, 610  
 PCB 151, 610  
 PCB 153, 610, 614, 625, 629, 631, 632, 634, 635,  
     638, 639, 641  
 PCB 155, 610  
 PCB 156, 610, 614, 615  
 PCB 157, 610, 614, 638  
 PCB 158, 610  
 PCB 159, 610  
 PCB 163, 611, 633  
 PCB 165, 611, 624  
 PCB 166, 611  
 PCB 167, 611, 614  
 PCB 168, 611  
 PCB 169, 611, 614, 632, 634, 637  
 PCB 170, 611, 614, 624, 625, 629, 632  
 PCB 174, 611  
 PCB 177, 611, 634  
 PCB 179, 611  
 PCB 180, 611, 614, 625, 629, 632, 639  
 PCB 183, 611  
 PCB 185, 611  
 PCB 187, 611, 629  
 PCB 189, 611, 614  
 PCB 190, 611  
 PCB 191, 611  
 PCB 194, 611  
 PCB 195, 611  
 PCB 201, 611  
 PCB 203, 611  
 PCB 205, 611  
 PCB 206, 611  
 PCB 209, 611  
 PCDDs, 261–267, 270–272, 274, 277,  
     278, 618  
 PCDFs, 267, 272, 618  
 PCP, 589–602, 604–606  
 PDD 6040-I, 246  
 Pencloraol, 592  
 Penicillamide, 6  
*D*-Penicillamine, 172, 328, 424,  
     577, 850  
 Penicillamine, 328, 334, 396, 424, 570  
 Pennsylvania, 60, 68, 84, 96, 106, 137, 388,  
     389, 513, 515, 517, 518, 670, 691,  
     770, 841, 854  
 Penobscot Bay, Maine, 656  
 Penta, 172, 263, 264, 267, 274, 608, 621, 623,  
     625, 627, 630  
 Pentaborane, 59, 61, 63, 72  
 Pentachlorobenzene, 590  
 2,2',4,5,5'-Pentachlorobiphenyl, 610  
 2,3,3',4,4'-Pentachlorobiphenyl, 610  
 3,3',4,4',5-Pentachlorobiphenyl, 611  
 Pentachlorobiphenyls, 608, 610,  
     623, 630  
 Penta-chlorocyclopentadiene, 113  
 1,2,3,7,8-Pentachlorodibenzodioxin, 263,  
     267, 274  
 1,2,4,7,8-Pentachlorodibenzodioxin, 263  
 2,3,4,7,8-Pentachlorodibenzofuran, 613

## General Index

- Pentachlorophenol, 589–606  
 criteria  
   human health protection, 603, 604  
   natural resources protection, 602, 603  
 effects  
   aquatic biota, 597–599  
   birds, 599  
   mammals, 599–601  
   terrestrial plants and invertebrates, 596, 597  
 environmental chemistry, 590–595  
 fate, 593–595  
 measurement, 595, 599  
 odor threshold, 605  
 persistence, 595, 596, 598, 601, 606  
 properties, 591, 593, 598  
 recommendations, 601, 606  
 sources, 590, 591, 600  
 uses, 590, 592  
 2,3,4,5,6-Pentachlorophenol, 592  
 Pentachlorophenol-glucuronide, 597, 598  
 Pentachlorophenol laurate, 591  
 Pentachlorophenols, 262, 267, 589–601, 604–606  
 Pentachlorophenol-sulfate, 597  
 Pentacon, 592  
 Pentafluorobenzyl bromide, 789  
 Penta general weed killer, 592  
 Penta-kil, 592  
*N*-Pentane, 46  
 2,4-Pentanedione, 852  
 Pentanol, 592  
 Pentasol, 592  
 Pentlandite ((FeNi)<sub>9</sub>S<sub>8</sub>), 535  
 Pentobarbital, 794  
 Pentose phosphate, 30, 216, 361, 577  
 Pentyltins, 812  
 Penwar, 592  
 People's Republic of China, see China, 175, 317, 366, 677, 683, 688  
 Perhydrohistrionicotonin, 300  
 Permicide, 592  
 Permaguard, 592  
 Permasem, 592  
 Permatox, 592  
 Permethrin, 299  
 Perry, Florida, 102  
 Peru, 162, 316, 374, 409, 474, 762, 842  
 Perylene, 648, 656, 664, 665  
 pH 60–40, 246  
 Phenacide, 830  
 Phenanthrene, 647, 648, 650–652, 655, 657, 658, 661, 662, 664–667, 669, 671  
 1,10-Phenanthroline, 577  
 Phenatox, 830  
 Phenethyl isothiocyanate, 659  
 Phenobarbital, 172, 577, 600, 614, 615, 839  
 Phenolic acid, 62  
 Phenols, 271, 307, 574, 594, 596, 597, 600, 653, 659, 663, 667  
 Phenothrin, 299  
 3-Phenoxybenzaldehyde, 298, 306  
 3-Phenoxybenzoic acid, 301, 306, 307  
 3-Phenoxybenzoyl cyanide, 298  
 3-Phenoxybenzoyl glycine, 307  
 3-Phenoxybenzyl alcohol, 294, 307  
 3-Phenoxybenzyl cyanide, 298  
 3-Phenoxybenzyl methylbutyric acid, 298  
 Phenoxy herbicides, 261, 262, 266, 271, 272, 277  
 Phenoxyphenols, 590, 593, 601, 606  
 2-Phenoxyphenols, 593, 599  
 4-Phenoxyphenols, 593  
 Phenvalerate, 295  
 Phenyl acetate ester, 294  
 L-Phenylalanine, 463  
 Phenylarsonic acids, 20, 42  
 Phenylmercurials, 417, 423, 447  
 Phenylmercuric acetate, 491  
 Phenoloxidase, 247  
 Phenyltins, 823  
 Phenytoin, 172, 839  
 Philadelphia, Pennsylvania, 401  
 Philippines, 316, 330, 352, 474, 535  
 Phosphate, 21, 22, 24, 30–34, 42, 67, 69, 78, 138, 225, 226, 235, 373, 388, 389, 415, 523, 541, 590, 593, 606, 685, 741, 796, 867, 868  
 Phosphocreatinine, 226  
 Phosphodiesterase, 300  
 Phosphofructokinase, 186, 792  
 Phosphomolybdic acid, 63  
 Phosphorothioic acid, 129, 240  
 Phosphorothioic acid *O,O*-diethyl *O*-(6-methyl-2-(methylethyl)-4-pyrimidinyl) ester, 234, 242  
 Phosphorothioic acid *O,O*-diethyl *O*-(3,5,6-trichloro-2-pyridinyl) ester, 129, 130, 135  
 Phosphorothioic acid, *O*-[4-(dimethylamino)sulfonyl], phenyl *O,O*-dimethyl ester, 279, 281, 290  
 Phosphorothioic acid, *O,O*-dimethyl *O-p*-(dimethylsulfamoyl) phenyl ester, 281  
 Phosphorothioic acid, *O,O*-dimethyl-,*O*-ester with *p*-hydroxy-*N,N*-dimethylbenzene sulfonamide, 281  
 Phosphorus, 20, 30, 32, 62, 67, 69, 163, 183, 212, 288, 378, 381, 433, 520, 541, 549, 555, 702, 743, 847, 850, 856, 869  
 Phosphorus-32, 728, 731  
*Cis*-photochlordane, 121, 122  
 Photomirex, 508, 515

*General Index*

- Photons, 679, 680, 733–735  
 Phytate, 167, 846, 860, 862, 885, 887  
 4-Picolinic acid, 579  
 Picrotoxin, 300  
 Pillarquat, 576  
 Pillarxone, 576  
 Pindone, 807  
 Piperonyl butoxide, 301, 304, 660  
 Planar PCBs, 612–615, 617, 619, 620, 624, 629, 632, 635, 642, 643  
 Planck's constant, 679, 735  
 Plants, terrestrial  
     acrolein, 7, 8  
     arsenic, 29–31  
     atrazine, 49–51  
     boron, 66, 67  
     cadmium, 79, 80, 87  
     carbofuran, 100  
     chlordane, 111, 115  
     chlorpyrifos, 131  
     chromium, 140, 141, 146, 155  
     copper, 175, 180, 183, 184  
     cyanide, 215–217  
     diazinon, 242  
     diflubenzuron, 249, 250  
     dioxins, 268  
     famphur, 287  
     fenvalerate, 303, 304  
     gold, 332  
     lead, 381, 382, 388, 389  
     mercury, 450  
     mirex, 508  
     molybdenum, 522, 523, 529  
     nickel, 548, 550, 551, 556, 557  
     paraquat, 580–582, 587  
     pentachlorophenol, 596, 597  
     polychlorinated biphenyls, 633  
     polycyclic aromatic hydrocarbons, 659, 660  
     radiation, 713, 714  
     selenium, 741  
     silver, 770, 772  
     sodium monofluoroacetate, 795–797  
     tin, 814  
     toxaphene, 830–832  
     zinc, 854, 855, 860, 865, 866  
 Platinum, 203, 321, 323–325, 329, 331–333, 350, 762  
 Platt River Basin, 854  
 Plumbism, 394, 395  
 Plutonium-238, 685, 686, 697, 698, 727  
 Plutonium-239, 685–689, 692, 696, 697, 716, 720, 721, 724, 727, 728, 731,  
 Plutonium-240, 686–689, 692, 697, 716, 727  
 Plutonium-241, 686, 697, 723  
 Plutonium-242, 686, 727  
 Plutonium-244, 686  
 PNAs, 646  
 Pocone, Brazil, 477  
 Poland, 179, 332, 385, 697  
 Polonium-210, 682, 686, 689, 692, 721, 724, 728, 731  
 Polonium-211, 682  
 Polonium-212, 682  
 Polonium-214, 682, 720  
 Polonium-215, 682  
 Polonium-216, 682, 720  
 Polonium-218, 682  
 Polyacrylonitriles, 213  
 Polychlorinated biphenyls (PCBs), 116, 124, 262, 266, 267, 274, 278, 436, 511, 512, 514, 607, 608, 611–615, 617–643, 833, 837  
     carcinogenicity, 611, 613, 634, 637, 643  
     concentrations in field collections  
         abiotic materials, 620–623  
         aquatic organisms except marine mammals, 625–630  
         birds, 630–632  
         mammals  
             marine, 623, 625  
             terrestrial, 632–634  
         reptiles, 630  
     criteria  
         human health protection, 640, 641  
         natural resources protection, 639, 640  
     effects  
         aquatic organisms, 634, 635  
         birds, 636, 637  
         mammals, 637, 639  
     quantification, 617, 618, 620, 641, 642  
     properties  
         biochemical, 608–620  
         chemical, 608–620  
         physical, 612, 613  
     recommendations, 639–643  
     sources, 607, 608  
     structure-function relations, 614, 615  
     teratogenicity, 614, 634, 638  
     uses, 607, 608  
 Polychlorinated dibenzofurans, 267, 272, 618  
 Polychlorinated dibenzo-*para*-dioxins, 261–267, 270–272, 274, 277, 278, 618  
 Polychlorocamphene, 830  
 Polycyclic aromatic hydrocarbons (PAHs), 542, 645–676  
     carcinogenicity, 668, 669  
     concentrations in field collections  
         abiotic materials, 655, 656  
         biota, 656–659  
     criteria  
         human health protection, 669–671  
         natural resources protection, 671, 672

## General Index

---

- Polycyclic aromatic hydrocarbons (PAHs) (cont'd)  
 effects  
   amphibians, 665  
   aquatic biota, 660–665  
   birds, 665, 666  
   fungi, 659  
   mammals, 666–669  
   reptiles, 665  
   terrestrial plants, 659, 660  
 fate, 651–654  
 mutagenicity, 651, 653, 656, 659, 663, 668, 673  
 nomenclature, 646  
 properties, 646, 647  
 recommendations, 669–675  
 ring structures  
   carcinogenic PAHs, 649  
   noncarcinogenic PAHs, 648  
 sources, 647–651  
 teratogenicity, 645, 653, 668, 675  
 Polycyclic organic matter, 646  
 Polyethylene glycol, 574  
 Polymethacrylates, 574  
 Polynuclear aromatic hydrocarbons, 646  
 Polysaccharides, 62, 245, 247, 255  
 Polyurethane, 213, 283, 403, 540, 619  
 Poplar Creek, Tennessee, 425  
 Porcine parakeratosis, 865  
 Porphyria, 274, 642  
 Porphyrinogen decarboxylase, 613  
 Portugal, 25, 841  
 Positron, 325, 678, 679, 732, 734, 735  
 Potassium, 20, 66, 166, 169, 181, 207, 300, 304,  
   316, 332, 366, 368, 450, 522, 541, 578,  
   702, 703, 704, 706, 708, 715, 722, 790,  
   793, 856  
 Potassium-40, 681, 730, 680, 689, 690  
 Potassium-42, 686  
 Potassium arsenite, 20  
 Potassium borate, 69  
 Potassium chloride, 184, 211, 377, 414  
 Potassium cyanide, 217, 226  
 Potassium monofluoroacetate, 783  
 Potassium sorbate, 788  
 Powellite, 518  
 PP 148, 576  
 PP 910, 576  
 Pralidoxime, 235  
 Pralidoxime chloride, 280, 288  
 Praseodymium-144, 698  
 Praseodymium-147, 723  
 Preeglone, 576  
 Priltox, 592  
 Prince Edward Island, Canada, 384  
 Prince Patrick Island, Arctic Ocean, 633  
 Priority Substances List, 533  
 Procainamide, 795  
 Procaine hydrochloride, 795  
 Profenofos, 251, 301  
 Prolactin, 561–563  
 Proline, 865  
 Promethium-147, 723  
 2-Propenal, 4  
 Beta-Propionaldehyde, 6  
 Propionitrile, 204  
 Proporphyrinogen, 392  
 Propranolol, 301  
 Propylene, 3, 230, 361, 446  
 Protactinium-231, 682, 687  
 Protactinium-234, 682  
 Protein kinase C, 269, 335  
 Proton, 205, 325, 678–680, 732, 734, 735  
 Prussian blue, 202, 706  
 Prussic acid, 203  
 Puget Sound, 19  
 Puerto Rico, 140, 148, 151, 443, 714, 837  
 Puget Sound, Washington, 25, 629, 664, 770  
 Purple of Cassius, 327  
 Pydrin, 295  
 Pyrazole, 807  
 Pyrene, 646, 648, 650, 656–658, 660, 661,  
   663–666, 668, 670, 674, 675  
   1-OH pyrene, 675  
   2-(1-pyrenyl) ethyldimethylsilylated silica, 619  
 Pyrethrins, 293, 294  
 Pyrethroids, 95, 293–295, 297, 299–301, 303, 306,  
   309, 311, 837  
 Pyridine, 62, 575  
 2-Pyridinealdoxime methochloride, 239  
 Pyridoxal 5-phosphate, 209  
 Pyridoxine, 62, 846, 887  
 Pyridoxine hydrochloride, 68  
 Pyridoxal phosphase, 63  
 Pyrimidinol, 236, 241  
 Pyrinex, 130  
 Pyrites, 314, 366, 368  
 Pyruvic acid, 793
- Q**  
 Quebec City, Canada, 317, 425, 471, 496, 536,  
   651, 878  
 Quicksilver, 407  
 Quinolinic acid, 239  
 Quinones, 652, 653, 659, 667
- R**  
 Radiation, 677–681, 683–686, 688, 689, 691–693,  
   696, 699–704, 706, 707, 709–723,  
   729–736



*General Index*

- carcinogenicity, 719–721  
 case histories, 692–693  
     Chernobyl  
         local effects, 698, 699  
         nonlocal effects, 704–709  
         Pacific Proving Grounds, 693–696  
 criteria  
     human health protection, 708  
     natural resources protection, 704, 724, 731  
 effects  
     ionizing radiations, 678, 679, 709, 711–713, 715, 717–719, 721  
         amphibians, 703, 709, 711, 717, 731  
         aquatic organisms, 639, 710, 714, 715, 731  
         birds, 687, 690, 691, 696, 700, 703, 708, 710, 711, 717, 718, 720, 731  
         mammals, 691, 700, 701, 704, 710–713, 717–720, 722, 731  
         reptiles, 703, 711, 717  
         terrestrial plants and invertebrates, 713, 714  
     nonionizing radiations, 709, 710  
         ELF electromagnetic fields 710  
         microwaves, 679, 710  
         radiowaves, 734  
         ultraviolet radiation, 701, 709, 710  
         visible radiation, 710, 734  
 glossary, 678, 683, 732  
 mutagenicity, 707, 718, 721, 731  
 physical properties, 678, 679  
     electromagnetic spectrum, 679, 734  
     linear energy transfer, 680, 712, 734, 735  
     new units of measurement, 680  
     radionuclides, 677, 679, 680, 681, 683, 685–693, 696, 697, 703, 704, 706, 709, 712, 715–718, 722, 723, 725, 726, 729–734, 736  
 radionuclide concentrations in field collections, 688, 689, 691, 730  
     abiotic materials, 688  
     biota, 685, 686, 689, 690, 702, 715, 730  
 recommendations, 723, 725, 727, 729  
 sources, 677, 680, 681, 683–685, 687, 691, 702–703, 705, 709, 714, 715, 724, 728, 730, 731  
     anthropogenic, 677, 678, 681, 683, 685, 688, 709, 716  
     dispersion, 681, 687–689, 730  
     natural, 677, 680–685, 688–692, 704, 709, 717, 722, 724, 726, 729–731  
     teratogenicity, 702, 703, 709, 721, 724, 725  
     uses, 680, 681, 683, 685, 687  
 Radiation absorbed dose (rad), 735  
 Radiation dose, 396, 465, 677, 681, 683, 691, 703, 704, 706, 711, 712, 716, 733–736  
 Radioactivity, 54, 86, 122, 677, 678, 681, 683, 685–688, 690, 693, 696, 698–700, 702, 704–707, 712, 726, 730, 735, 792, 796  
 Radioisotope thermoelectric generators (RTG), 685  
 Radionuclide, 680, 681, 683, 688–692, 696, 700, 702, 703, 715, 716, 718, 722, 723, 727, 729–735  
 Radium-223, 682  
 Radium-224, 682  
 Radium-226, 685  
 Radium-228, 682  
 Radium jaw, 720  
 Radon, 344, 345, 683, 685, 691, 720, 723, 724, 726, 728  
 Radon-218, 682  
 Radon-219, 682  
 Radon-220, 682  
 Radon-222, 681, 682, 685, 689, 720, 724  
 Rainy River, Ontario, 265  
 Ramrod, 46  
 Rancher's Supply, 785  
 Raritan Bay, New Jersey, 391, 623  
 Raritan River, New Jersey, 118  
 Ravenglass estuary, England, 690  
 Red squill, 783  
 Reductases, 62  
 Reed City, Michigan, 658  
 Reese Air Force Base, Texas, 656  
 Relative biologic effectiveness, 735, 736  
 Reptiles  
     cadmium, 84  
     carbofuran, 96  
     chlordane, 118, 122  
     chlorpyrifos, 134  
     copper, 173, 178, 198  
     cyanide, 202, 203, 219  
     fenvalerate, 294, 298, 311  
     gold, 353, 355, 360, 363  
     lead, 383, 392  
     mercury, 434, 435, 445, 499, 500  
     mirex, 510, 511  
     paraquat, 587, 588  
     polychlorinated biphenyls, 630  
     polycyclic aromatic hydrocarbons, 665  
     radiation, 703, 717  
     sodium monofluoroacetate, 788, 792, 793, 795, 796, 798, 805–807  
     zinc, 845  
 Republic of South Africa, 137, 316, 318, 535  
 Resmethrin, 293, 299  
 Resorcinols, 4, 264,  
 Retinoids, 267, 274

## General Index

---

- Retinol, 274, 638  
 Retinyl ester hydrolase (REH), 638  
 Rhine River, 858  
 Rhode Island, 33, 148, 157, 196, 255, 650, 762  
 Rhode River, Maryland, 49  
 Rhodanese, 206–208, 216, 220, 221, 225–227, 232, 256, 360, 361  
 Rhone River, 716  
 Riboflavin, 62, 63, 68  
 D-Ribose, 68  
 Ribulose diphosphate carboxylase, 206  
 Rice Lake, Ontario, 628,  
 Rio Grande Valley, Texas, 832, 840  
 River Ljubjanica, 156  
 Road salts, 211  
 Rochester, New York, 513  
 Rocky Mountain National Park, Colorado, 387  
 Rocky Mountains, 285, 319, 740  
 Roentgen equivalent, man (rem) 735, 736  
 Roentgen equivalent, physical (rep), 736  
 Romania, 126, 229, 313, 355, 356, 697, 704  
 Romans, 374, 473, 842  
 Ronnel, 262  
 Rongpihoon district, Thailand, 40  
 Roosevelt, President Franklin Delano, 319  
 Ross Island, Antarctica, 620  
 Rotenone, 829  
 Rubidium-87, 680  
 Russia, 27, 60, 141, 315, 318, 331, 402, 409, 543, 552, 566, 698, 701, 702, 704, 730, 807, 832  
 Ruthenium, 324, 704  
 Ruthenium-103, 697, 698  
 Ruthenium-106, 697, 898, 716  
 Rwanda, 318
- S**
- S-5602, 295  
 Saanach Inlet, British Columbia, 451  
 Sacramento River Basin, California, 481  
 Sacramento–San Joaquin River system, 135, 241  
 Sado Island, Japan, 331  
 Saginaw Bay, Michigan, 265, 266, 631, 632  
 Saginaw River, 266  
 St. Kilda, 80  
 St. Lawrence estuary, 448, 625  
 St. Lawrence River, 511, 612, 624, 625, 641  
 St. Louis, Missouri, 117  
 St. Lucia, 442  
 Saguenay River, Quebec, 425  
 Salicylamide, 598  
 Salicylates, 600  
 Samarium-143, 680  
 Samarium-151, 723  
 San Diego Bay, 179  
 San Francisco Bay, 176, 178, 623, 658, 743, 761, 770, 771  
 San Joaquin County, California, 95  
 San Joaquin River, California, 64, 135, 521, 742  
 San Joaquin Valley, California, 68, 737, 742, 752, 832  
 Sanmarton, 295  
 Sanochrysin, 323  
 Santee River Basin, South Carolina, 481  
 Santobrite, 592  
 Santophen, 592  
 Sardinia, 318  
 Sargasso Sea, 33, 116  
 Sarin, 279  
 Sarolex, 234  
 Scandinavia, 77, 137, 209, 232, 624, 640, 705, 730, 837  
 Scandium, 140  
 Schistosomiasis, 9, 161, 164, 591, 815, 825  
 Scotland, 25, 178, 211, 213, 353, 385, 687  
 Scrub typhus, 784  
 SD 43775, 295  
 Sea of Japan, 331  
 Seattle, Washington, 364, 629  
 Selenates, 738, 739  
 Selenides, 426, 545, 738, 739  
 Selenites, 738, 739  
 Selenium, 737–759  
     concentrations in field collections, 740–743  
     criteria  
         human health, 740, 741, 753, 758  
         natural resources, 738  
     deficiency, 743, 744  
     effects  
         lethal, 745–749  
         protective, 743, 744  
         sublethal, 749  
     environmental chemistry, 738, 739  
 Selenium-75, 338, 740–742, 751  
 Selenium dioxide, 738, 739  
 Selenium-methylselenocysteine, 743  
 Selenium-methylselenomethionine, 743  
 Selenium sulfide, 739  
 Selenocyanate, 222  
 Selenocystathionine, 743  
 Selenocysteine, 425, 738, 743  
 Selenocystine, 743, 744  
 Seleno-DL-methionine, 23, 460, 461, 752  
 Seleno-L-methionine, 745, 752,  
 Selenomethionine, 24, 460, 738, 743–745, 749, 751–753, 755  
 Selenopurine, 745  
 Sellafield, U.K. 686, 688, 692  
 Selocide, 742

*General Index*

- Serine protease, 247  
 Serpent River, Canada, 692  
 Serra Pelada, 318  
 Serva SP-1, 619  
 Seveso, Italy, 261, 267, 271, 274  
 Shangdong peninsula, 317  
 Shatt al-Arab River, Iraq, 117  
 Shell atrazine herbicide, 55, 590  
 Shenandoah Valley, Virginia, 514  
 Siberia, 352, 427  
 Sickle cell anemia, 843, 877  
 Sierra Nevada Mountains, California, 129, 314  
 Sievert, 683, 733, 735, 736  
 Silesia, 313  
 Silica, 78, 211, 342, 343, 344, 345, 346, 347, 619, 688  
 Silicate, 67  
 Silicoborate, 67  
 Silicon, 174, 331, 344, 346, 414, 845, 860  
 Silicosis, 342–347, 369  
 Silver, 761–782  
     carcinogenicity, 21  
     concentrations  
         in abiotic materials, 769, 770  
         in biota, 769, 781  
     criteria  
         human health, 778, 779, 781  
         natural resources, 779–781  
     effects, 772–778, 779  
     interactions, 780  
     metabolism, 776–769  
     mutagenicity, 772, 777, 782  
     properties, 764–769, 780  
     sources, 761–763  
     teratogenicity, 772, 782  
     uses, 763, 764  
 Silver-110, 697, 698  
 Silver-110m, 709, 716  
 Silver acetate, 764, 769  
 Silver acetylde, 764  
 Silver albuminate, 767, 778  
 Silver azide, 764  
 Silver carbonate, 766  
 Silver chloride, 765–768, 775, 778  
 Silver cyanide, 203, 219, 778  
 Silver fulminate, 778  
 Silver iodide, 762, 763, 769, 770, 781  
 Silver ion, 765–769, 772, 773, 775, 776, 780–782  
 Silver nitrate, 761, 763, 764, 766–768, 772, 775–778  
 Silver oxalate, 764  
 Silver oxide, 777  
 Silver phosphate, 767  
 Silver selenide, 769  
 Silver sulfate, 766  
 Silver sulfide, 763, 765–768, 772, 774–776  
 Silver sulfadiazine, 763  
 Silver thiolate, 765  
 Silver thiosulfate, 763, 765, 766, 775  
 Silvex, 262, 277  
 Silvisar 550, 36  
 Sinituho, 592  
 Simav River, Turkey, 64  
 Singapore, 313  
 Siskiwit Lake, Isle Royale, Lake Superior, 265, 620  
 Slovak Republic, 432, 484, 488, 490  
 Slovenia, 156, 409, 429  
 Snap 9A, 685  
 Sodium acetate, 789, 793–795, 806  
 Sodium arsenate, 18, 19, 29, 30, 33, 35, 37, 40  
 Sodium arsanilate, 42  
 Sodium arsenite, 3, 19, 20, 24, 29, 30, 33–36  
 Sodium aurothiomalate, 323, 333  
 Sodium bicarbonate, 790  
 Sodium bisulfite, 14  
 Sodium borate, 61, 63, 73  
 Sodium borohydride, 70  
 Sodium cacodylate, 30  
 Sodium chromate, 143, 147, 154  
 Sodium citrate, 378  
 Sodium cyanide, 201, 203, 210, 211, 217, 219–221, 225, 226, 230, 231, 353, 355, 358, 359, 370, 786  
 Sodium diethyl dithiocarbamate, 570  
 Sodium ferrocyanide, 211  
 Sodium fluoacetate, 789  
 Sodium fluoride, 205, 796  
 Sodium fluoroacetate, 789, 802  
 Sodium gating kinetics, 299, 300  
 Sodium hexacyanoferrate, 211  
 Sodium *alpha* ketoglutarate, 794  
 Sodium molybdate, 523, 524, 526  
 Sodium monofluoroacetate, 783–807  
     antidotes, 793–795  
     chemical properties, 789, 790  
     effects  
         amphibians, 798  
         aquatic organisms, 797, 798  
         birds, 798–801  
         mammals, 801–805  
         terrestrial invertebrates, 795–797  
         terrestrial plants, 795–797  
     metabolism, 791–793  
     persistence, 790, 791  
     recommendations, 805–807  
     uses  
         domestic, 784–786  
         foreign, 786–788  
 Sodium nitrite, 107, 170, 208, 209, 223, 232  
 Sodium nitroprusside, 222

## General Index

- Sodium pentachlorophenate, 155, 589–592, 595  
 Sodium pyruvate, 68, 208  
 Sodium selenate, 744, 753, 754  
 Sodium selenite, 425, 739, 749  
 Sodium succinate, 793, 794, 806  
 Sodium sulfate, 191, 197, 617, 794  
 Sodium tetraborate, 60, 61  
 Sodium tetrachloroaurate<sup>+3</sup>, 339  
 Sodium thiocyanate, 210  
 Sodium thiosulfate, 24, 208, 209, 223, 232, 348, 349  
 Solganol, 323  
 Solsigne, France, 345  
 Soman, 279  
 Somes River, 356  
 D-Sorbitol hydrate, 68  
 Sorfjord, Norway, 379  
 South Africa, 45, 68, 137, 179, 297, 314, 316, 318, 341, 346, 347, 354, 402, 459, 486, 509, 535, 547, 565, 566, 589, 665, 709, 717, 762, 783, 786, 787, 795, 847  
 South America, 17, 313, 318, 342, 344, 352, 353, 356, 369, 416, 473, 474, 509, 597, 737, 795  
 South Carolina, 27, 137, 222, 294, 319, 356, 466, 481, 503, 510, 514, 623, 640, 689, 715, 718, 830  
 South Dakota, 211, 316, 319, 320, 344, 358, 359, 361, 483, 517, 737, 785  
 South Florida Basin, 481  
 South Korea, 313  
 South Platte River, Colorado, 741  
 South Pole, 854  
 Soviet Union, 13, 73, 126, 137, 157, 175, 192, 212, 229, 314, 316, 317, 366, 368, 407, 409, 484, 492, 497, 530, 531, 535, 567, 677, 683, 688, 691, 693, 696, 697, 757, 762, 780, 814, 825, 830, 842, 878  
 Spain, 88, 90, 111, 196, 374, 384, 385, 404, 409, 443, 473, 497, 632, 633, 708  
 Spangold, 321  
 Spectracide, 234  
 Spermidine, 2  
 Spermine, 2  
 Sphalerite, 331, 373, 842  
 Sporidesmin, 850  
 Spring River, Missouri, 266  
 Sri Lanka, 332  
 Stalinon, 809  
 Stannic tins, 810  
 Stannite, 813  
 Stannosis, 810  
 Stannous fluoride, 814, 827  
 Stannous tins, 810  
 Steel City-Bhilai, India, 440  
 Stereochemical structure, 293  
 Strobane-T, 830  
 Strontium, 522, 691, 706, 716  
 Strontium-89, 697, 698  
 Strontium-90, 690, 691, 697, 716, 726–728, 731  
 Strychnine, 783, 785  
 Strychnine sulfate, 748  
 Succinate, 789, 792  
 Succinate dehydrogenase, 783, 792  
 Succinic acid, 579  
 Succinonitrile, 204, 226  
 Sudan, 203, 212  
 Sudbury, Ontario, 178, 332, 533, 535, 536, 549–553, 739, 740, 758  
 Sulfate-reducing bacteria, 419, 457, 482, 702  
 Sulfates, 33, 140, 170, 364, 373, 414, 415, 740, 743, 764  
 Sulfotep, 234  
 Sulfur, 22, 35, 165, 170, 197, 203, 205, 206, 208, 220, 223, 224, 226, 293, 323, 325, 327, 328, 330, 338–340, 351, 355  
 Sulfur amino acids, 207, 231, 465  
 Sumicidin, 295  
 Sumifly, 295  
 Sumipower, 295  
 Sumitox, 295  
 Superoxide anion, 575, 576, 588, 597  
 Superoxide dismutase, 83, 166, 181, 557, 577, 581, 582, 845, 851  
 Supertoxic compounds, 304  
 Surinam, 318, 597, 599  
 Surveillance Index Classification, 258, 308  
 Susquehanna River, Maryland, 177  
 Susquehanna River, Pennsylvania, 770  
 Svalbard, Greenland, 633  
 Swayback, 180, 182, 199, 527  
 Sweden, 18, 141, 174, 183, 284, 348, 404, 408, 409, 411, 425, 431, 436, 468, 490, 495, 496, 518, 564, 567, 632, 656, 704, 706, 707, 725, 726, 741, 829, 832  
 Swedish Medical Board, 408  
 Sweep, 576, 645  
 Switzerland, 397, 404, 574, 629, 697, 780, 829  
 Sylvanite, 314, 325  
 Synklor, 113  
 Synthetic 3956, 830  
 Syria, 704  
 Syrup of ipepac, 581, 784

## T

- 2,4,5-T, 262, 264, 266, 268, 277  
 Tabun, 279  
 Tacoma, Washington, 18, 19, 629

*General Index*

- Tailings, 18, 42, 174, 202, 210, 215, 221, 222, 318, 330, 331, 340, 351–356, 358, 360, 366–368, 370, 379, 382, 383, 413, 419, 473, 477, 482, 518, 521, 522, 524, 525, 685, 691, 692, 740, 763, 722, 858
- Taiwan, 17, 27, 88, 89, 177, 252, 313, 443
- Tambora volcano, 427
- Tampa, Florida, 390
- Tampa Bay, 434, 625
- Tanzania, 224, 318, 474
- Tartrazine, 786
- Tasmania, 793, 802, 803, 886
- Tatchlor 4, 113
- 2,3,7,8-TCDD, 261
- Teart disease, 526
- Teflubenzuron, 251
- Telluride, Colorado, 140
- Tellurium, 314, 324–326, 425, 494, 498, 764
- Tellurium-127, 698
- Tellurium-129, 697
- Tellurium-132, 698
- Tenaklene, 576
- Ten-eighty, 789
- Tennessee, 154, 155, 373, 408, 425, 435, 442, 443, 466, 489, 492, 626, 627, 690, 692, 709, 842
- Teratogenicity
- acrolein, 7, 10, 12
  - arsenic, 28
  - atrazine, 54
  - boron, 68
  - cadmium, 87
  - carbofuran, 103, 107, 109
  - chlordane, 124
  - chlorpyrifos, 132
  - chromium, 145, 152, 153
  - copper, 172, 173, 193, 197
  - cyanide, 208, 226, 231, 232
  - diazinon, 237, 239
  - diflubenzuron, 256
  - dioxins, 264
  - fenvalerate, 301
  - gold, 336, 348, 350, 367, 369
  - lead, 371, 395
  - mercury, 447–449
  - mirex, 503, 515, 516
  - nickel, 542, 546–548
  - paraquat, 585
  - pentachlorophenol, 601, 604, 606
  - polychlorinated biphenyls, 614, 634, 638
  - polycyclic aromatic hydrocarbons, 645, 653, 668, 675
  - radiation, 702, 703, 709, 721, 724, 725
  - selenium, 737, 749, 750, 752, 753
  - silver, 772, 782
  - tin, 811
  - toxaphene, 835, 836
  - zinc, 853
- Term-1-trol, 592
- Tetraalkyl lead, 375, 376, 383, 390, 397
- Tetraalkyltins, 817, 827
- 1,4,8,11-Tetraazacyclotetradecane, 542
- Tetrabutyltins, 821, 823, 824
- Tetrachloroauric acid, 326
- Tetrachloro-1,4-benzoquinone, 600
- 2,2',4,4'-Tetrachlorobiphenyl, 609
- 2,2',5,5'-Tetrachlorobiphenyl, 609
- 3,3',4,4'-Tetrachlorobiphenyl, 610
- Tetrachlorobiphenyls, 609, 630
- 2,3,6,7-Tetrachlorobiphenylene, 264
- Tetrachlorobornanes, 830
- Tetrachlorocatechols, 594, 600
- 1,2,3,7-Tetrachlorodibenzodioxin, 265
- 1,2,3,8-Tetrachlorodibenzodioxin, 263, 265
- 1,3,6,8-Tetrachlorodibenzodioxin, 262, 263, 269, 270
- 1,3,7,8-Tetrachlorodibenzodioxin, 265
- 1,3,7,9-Tetrachlorodibenzodioxin, 262
- 2,3,7,8-Tetrachlorodibenzo-*para*-dioxin (2,3,7,8-TCDD), 172, 261, 262, 278, 617, 621, 624
- Tetrachlorodihydroxyl benzenes, 594
- Tetrachlorodiols, 594
- Tetrachlorohydroquinones, 594
- 2,3,5,6-Tetrachlorophenol, 600
- 2,3,4,5-Tetrachlorophenol, 600
- 2,3,4,6-Tetrachlorophenol, 593, 600
- Tetrachlorophenols, 594
- Tetrachlororesorcinol, 600
- Tetraethyldithiopyrophosphate, 234
- Tetraethyllead, 373, 375, 376, 389, 390, 395, 396
- Tetraethyltins, 821, 823–825
- Tetrahydro-5,5-dimethyl-2(1H)-pyrimidine, 516
- Tetrahydroquinone (TCHQ), 593
- Tetrahydrotetrols, 653
- Tetrahydrotriols, 653
- Tetramethrin, 293, 299
- Tetramethyltins, 816
- Tetramethyllead, 373, 375, 383, 389, 390, 395
- Tetraorganotins, 812, 822–824
- Tetraphenyltins, 821
- Tetrapropyltins, 823, 824
- Tetrathiomolybdates, 520
- Tetrodotoxin, 300
- Texas, 27, 96, 108, 118, 137, 140, 157, 266, 373, 409, 431, 435, 488, 492, 495, 501, 503, 517, 518, 528, 625, 656, 676, 685, 721, 742, 743, 769, 785, 786, 802, 829, 832, 833, 838, 840, 841, 860
- Texas Department of Health, 833
- Texas Organization for Endangered Species, 101

## General Index

---

- TH 6040, 246  
 Thailand, 17, 304, 443, 474, 489, 814  
 Thalidomide, 853  
 Thallium, 315, 744, 783  
 Thallium-206, 682  
 Thallium-207, 682  
 Thallium-208, 682  
 Thallium-210, 682  
 Thames River, England, 404  
 Theophrastus, 409  
 Thiamin, 378, 424, 494, 498, 875  
 Thiobarbitaric acid-reactive substances, 482  
 Thiocyanates, 205  
 Thioglucose gold, 323  
 Thiol ethers, 4, 5, 15  
 Thiols, 11, 327, 328, 334, 368, 424, 425, 498  
 Thiomolybdates, 519  
 Thioneine, 846  
 Thiopropanosulfonate gold, 323  
 Thiosulfate sulfur transferase, 220  
 Thiosulfates, 326, 368  
 Thorium, 685, 687, 725  
 Thorium-227, 682  
 Thorium-228, 728, 731  
 Thorium-230, 727, 728, 731  
 Thorium-231, 682  
 Thorium-232, 682, 727–729, 731  
 Thorium-234, 681  
 Three Mile Island, Pennsylvania, 696  
 Threshold hypothesis, 736  
 Threshold Limit Value, 39, 72, 88, 103, 231, 362, 569, 763, 779, 876  
 Thymidine, 710, 848  
 Thymidine kinase, 256  
 Tibet, 737  
 Times Beach, Missouri, 261  
 Tin, 809–828  
     carcinogenicity, 810–812  
     concentrations  
         in abiotic materials, 815, 816  
         in biota, 815  
     criteria  
         human health, 825, 826  
         natural resources, 825, 826  
     flux  
         to atmosphere, 815  
         to hydrosphere, 815  
     mutagenicity, 811  
     properties  
         inorganic tin, 810, 811  
         organotins, 811–813  
     sources, 813–815  
     teratogenicity, 811  
     toxicity, 809, 815, 818, 819, 821–824, 826–828  
     uses, 813–815  
     Tin-113, 811, 816  
     Tin-126, 727  
     Tisza River, 356  
     Tittabawasee River, 266  
     Titanium, 140, 317, 321  
     Tobacco amblyopia, 207, 222  
     Toft, Louisiana, 1  
     Tokyo, Japan, 2  
     Tokyo Bay, Japan, 117  
     Toluene, 631, 665  
     Tonga, 330  
     Topiclor, 113  
     Totacol, 576  
     Toxafeen, 830  
     Toxakil, 830  
     Toxaphene, 829–840  
         carcinogenicity, 836  
         concentrations in field collections  
             abiotic materials, 832–834  
             biota, 832–834  
         criteria  
             human health protection, 837–839  
             natural resources protection, 837–839  
         degradation, 831, 832, 837, 840  
         effects  
             lethal, 834, 835  
             sublethal, 835–837  
         interactions, 837  
         mutagenicity, 836  
         persistence, 829, 831, 832  
         properties, 830  
         recommendations, 837, 839  
         sources, 829, 830  
         transport, 829–832, 837, 839, 840  
         uses, 837, 839  
     Toxer total, 576  
     Toxic Equivalency Factors, 613, 614  
     Toxichlor, 113  
     Toxon 63, 830  
     Transferases, 62, 63, 240, 562, 613  
     Transuranic elements, 686, 723, 736  
     Trialkyl leads, 376  
     Trialkyltins, 812, 813, 817, 822–824  
     Tributyltins, 809, 812–816, 818, 820, 821, 823, 825  
     Tricarboxylic acid, 202, 792  
     Trichlorobenzenes, 262, 278  
     Trichlorobenzoquinones, 594  
     2,2',5-Trichlorobiphenyl, 609  
     Trichlorobiphenyls, 609, 612, 628  
     Trichlorobornane, 830  
     Trichlorodiols, 594  
     Trichlorohydroquinones, 600  
     *Cis-N-((Trichloromethyl)thio)-4-cyclohexane-1,2-dicarboximide*, 241  
     2,4,5-Trichlorophenol, 262, 593  
     2,4,6-Trichlorophenol, 593

*General Index*

- Trichlorophenols, 262, 267, 271  
 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), 262  
 Trichloropyridinol, 131  
 3,5,6-Trichloro-2-pyridinol, 129  
 Tricyclohexyltin bromide, 818  
 Tricyclohexyltin chloride, 821  
 Tricyclohexyltins, 812, 813, 815, 826  
 Triethylenetetramine, 542  
 Triethyl lead, 389  
 Triethyltin acetate, 809  
 Triethyltin chloride, 821  
 Triethyltin hydroxide, 818  
 Triethyltins, 812, 813, 817, 818, 821–827  
 Triglycerides, 191, 554  
 Trimethylarsine, 22, 33, 34  
 Trimethyl lead, 390, 399  
 Trimethylselenium chloride, 24  
 Trimethyltin chloride, 817, 821, 827  
 Trimethyltin hydroxide, 818  
 Trimethyltins, 812, 813, 817, 818, 820–822, 824, 827  
 Triorganotins, 809, 812, 813, 818, 822–825, 827  
 Tripentyltins, 818  
 Triphenyltin chloride, 821  
 Triphenyltin hydroxide, 818  
 Triphenyltins, 812, 818, 820, 823, 825  
 Tripropyltin chloride, 821  
 Tripropyltin oxide, 818  
 Tripropyltins, 812, 818  
 Trithiomolybdates, 520  
 Trivalent copper, 165  
 Trinidad, 739  
 Tripeptide glutathione, 654  
 Tritium, 678, 726, 734  
 Trivalent chromium, 137–139, 141–147, 151–153, 156, 157, 541  
 Troy, New York, 622  
 Tryptophan, 235, 239, 392, 456, 846, 887  
 Tsut sugamushi, 784  
 Tucurui Reservoir, Brazil, 478–480  
 Tukanoan Indians, 213  
 Tull Chemical, 784  
 Tungsten, 482, 518, 520, 525, 716, 748  
 Tungsten-181, 716  
 Tungsten-185, 723  
 Tunisia, 841  
 Turkestan, 737  
 Turkey, 1, 59, 60, 64, 355, 414, 489, 697, 841  
 Tyrosinase, 166, 168  
 Tyrosine kinase, 700
- U**
- U<sub>3</sub>O<sub>8</sub>, 685  
 USSR, 39, 374, 518
- United Kingdom, 21, 77, 151, 164, 179, 195, 208, 209, 232, 250, 402, 404, 495, 531, 573, 574, 595, 607, 677, 683, 692, 708, 709, 723, 726  
 United States of America, 2, 8, 41  
 U.S. Air Force, 688  
 U.S. Army Air Corps, 677  
 U.S. Bureau of Land Management, 358  
 U.S. Bureau of Mines, 353  
 U.S. Bureau of Reclamation, 8  
 U.S. Cavalry, 737  
 U.S. Department of Agriculture, 785  
 U.S. Department of the Interior, 785  
 U.S. Environmental Protection Agency, 111, 163, 261, 297, 427, 481, 483, 495, 499, 503, 533  
 U.S. Fish and Wildlife Service, 308, 365, 382, 404, 488  
 U.S. Food and Drug Administration, 126, 242, 409, 490, 515  
 U.S. Nuclear Regulatory Commission, 715  
 U.S. Occupational Safety and Health Administration, 344  
 U.S. Office of Scientific Research and Development, 783  
 Ural Mountains, 314  
 Uranium, 19, 155, 343, 408, 517, 518, 521, 528, 677, 685, 686, 691, 692, 720, 721, 723, 725, 727, 728, 734, 769  
 Uranium-233, 727  
 Uranium-234, 727  
 Uranium-235, 682, 727, 728, 731  
 Uranium-236, 727  
 Uranium-238, 680, 681, 686, 721, 727, 729, 731  
 Uranium dioxide, 685  
 Uranium hexafluoride, 685  
 Urease, 554  
 Uridine diphospho N-acetyl glucosamine, 247  
 Utah, 137, 211, 316, 319, 320, 373, 374, 518, 737, 742, 746, 762, 857
- V**
- Vanadium, 141, 142, 518, 520, 524, 549, 851  
 Vancouver, British Columbia, 657  
 Vapotone, 830  
 Velsicol 1068, 113  
 Venezuela, 45, 316, 318, 344, 474  
 Vermont, 89, 135, 159, 484, 492, 565, 878  
 Vero Beach, Florida, 650  
 Victoria, Australia, 787  
 Vigilante, 246  
 Vietnam, 261, 268, 271, 443, 474  
 Vinyl acetate, 11

## General Index

---

Vinyl cyanide, 11  
 Virgin Islands, 837  
 Virginia, 96, 157, 195, 233, 318, 374, 427, 488,  
 514, 640, 825, 827  
 Virginia City, Nevada, 474, 481  
 Vitamin A, 267, 274, 613, 637, 638, 665, 669, 850,  
 860, 862, 863, 875  
 Vitamin B<sub>6</sub>, 209  
 Vitamin B<sub>12</sub>, 207  
 Vitamin C, 392, 505, 542  
 Vitamin D, 65, 378  
 Vitamin D<sub>3</sub>, 34, 68, 69  
 Vitamin E, 138, 301, 378, 424, 577, 578, 584,  
 669, 699, 743, 744, 748, 753, 764,  
 769, 781  
 Vitamin K, 222

## W

Waimakariri River, New Zealand, 574  
 Wailoa River, 25,  
 Wako active carbon, 619  
 Wales, 17, 183, 332, 632  
 Wallace Bay, Nova Scotia, 384  
 Wanapitei River, Canada, 553  
 Wando River, South Carolina, 623  
 Warbex, 279, 281, 290  
 Warfarin, 788  
 War Production Board, 319  
 Washington, D.C., 381  
 Washington state, 372, 485, 495, 650, 691, 737  
 Waukegan Harbor, Illinois, 621  
 Waynesboro, Virginia, 427  
 Weak acid dissociable cyanide, 355  
 Wechsler Intelligence Scale IQ, 40  
 Weed-beads, 592  
 Weedol, 576  
 Weedone, 592  
 West Point Lake, Georgia, 645  
 West Virginia, 137, 250, 254, 287  
 Wheatley Harbor, Lake Erie, 621  
 White muscle disease, 743, 744  
 White Oak Lake, Wisconsin, 154,  
 Wilson's disease, 167, 168, 170, 178, 189,  
 190, 197  
 Windscale, United Kingdom, 696, 709  
 Wisconsin, 25, 163, 192, 196, 265–267, 403, 413,  
 426, 436, 438, 485, 487, 489, 492, 513,  
 564, 566, 604, 629, 632, 641, 642, 714,  
 786, 838, 878, 879  
 Wisconsin River, 442, 465  
 Witwatersrand goldfields, 316, 318, 345, 353  
 WL 43775, 295  
 Wolframate, 525

World Health Organization, 92, 228, 402, 450, 477,  
 478, 533  
 World War I (1914–1918), 3, 211  
 World War II (1939–1945), 319, 783  
 Wulfenite, 518  
 Wurtzite, 842  
 Wye River, Maryland, 48  
 Wyoming, 211, 241, 365, 385, 427, 519, 692, 737,  
 785, 786

## X

Xanthine dehydrogenase, 525  
 Xanthenes, 631  
 Xanthine oxidase, 517, 518, 526  
 Xanthonenes, 631  
 Xenon-131, 685  
 Xenon-133, 685, 697  
 X-rays, see *Photons*, 335, 542, 677–681, 683, 717,  
 719, 732–736  
 Xylene, 504

## Y

Yakima, Washington, 233  
 Yaltox, 96  
 Yellowcake, 685  
 Yellowknife Bay, Canada, 214, 358  
 Yellow prussiate of soda, 211  
 Yellowstone River, 741  
 Yttrium-90, 715  
 Yttrium-91, 715  
 Yucatan, Mexico, 384  
 Yugoslavia, 37, 41, 356, 374, 407, 409, 435, 497,  
 499, 697  
 Yukon Territory, 317

## Z

Zaire, 224, 318  
 Zambia, 175, 345  
 Zimbabwe, 175, 316, 318, 345, 352, 354  
 Zinc, 841–889  
     carcinogenicity, 851  
     concentrations  
         in abiotic materials, 853  
         in biota, 854–860  
     criteria  
         human health, 883, 886, 889  
         natural resources, 878, 842  
     deficiency, 841–843, 846–849, 851–853,  
         860–865, 874–877, 881, 883, 886–888  
     effects, 841–843, 847–851, 853, 857, 860, 861,  
         863, 865–867, 869, 871–889



---

*General Index*

- interactions, 843, 848, 862, 868, 886–889
- metabolism, 843, 845, 847, 848, 851, 853, 855, 859–863, 865, 866, 874, 875, 886–889
- mutagenicity, 851, 852
- properties, 843–845, 847, 849, 866, 872
- sources, 841–843, 853, 855, 859, 860, 887, 889
- teratogenicity, 851, 853, 888
- uses, 842, 883
- Zinc-65, 718, 872, 873
- Zinc acetate, 850, 852
- Zinc aquo ion, 843–845, 886, 887
- Zinc bicarbonate, 20, 169, 205, 764, 790
- Zinc borate, 69
- Zinc carbonate, 844, 845
- Zinc chloride, 843, 844, 851, 852, 882, 886
- Zinc chromate, 154, 853
- Zinc cyanide, 410
- Zinc humic acid, 844
- Zinc hydroxide, 845
- Zinc monohydroxide, 844
- Zinc oxide, 841, 842, 844, 852, 875–877, 882, 883
- Zinc 2,4-pentanedione, 852
- Zinc phosphate, 155, 857, 870
- Zinc phosphide, 875
- Zinc sulfate, 197, 842–844, 850, 862, 875, 877
- Zinc sulfide, 331
- Zinc undecylenate, 331
- Zineb, 851
- Ziram, 851
- Zirconium, 332, 522
- Zirconium-95, 697, 698
- $[\text{Zn}(\text{H}_2\text{O})_6]^{2+}$  843, 844, 887