PB-298 981/1ST NTIS Prices: PC A08/MF A01

The Sources and Ambient Environmental Levels of Known or Potential Toxic Substances in the Lake Champlain Drainage Basin

Lake Champlain Basin Study, Burlington, VT.;*New York State Dept. of Environmental Conservation, Albany.

AUTHOR: Bogden, Kenneth G.
Final rept.
P1980HO Fld: 13B, 68D GRAI7918
Oct 78 193p
Rept No: LCBS-21
Monitor: 18
Prepared in cooperation with New York State Dept. of Environmental Conservation, Albany.

Descriptors: *Industrial wastes, *Toxicity, *Water pollution, *Lake Champlain, Public health, Mercury(Metal), Trace elements, Fishes, Pesticides, Chlorohydrocarbons, Biphenyl, New York, Vermont, Tables(Data), Concentration(Composition)

Identifiers: Polychlorinated biphenyls, Biphenyl/chloro, Trace metals, NTISNERBC

PB-292 419/9ST NTIS Prices: PC A03/MF A01

Summary Characterizations of Selected Chemicals of Near-Term Interest

Environmental Protection Agency, Washington, DC. Office of Toxic Substances.
Final rept.
F11104 Fld: 6T, 6J, 68, 68G, 57Y, 57U, 99 GRAI7913
Sep 78 31p
Rept No: EPA/560/4-78/008
Monitor: 18
See also report dated Sep 75, PB-246 366.

Descriptors: *Environmental surveys, *Chlorine organic compounds, *Dichlorodifluoromethane, *Vinyl chloride, *Phthalic acids, *Chloroform, *Lead(Metal), Lead inorganic compounds, Lead organic compounds, Esters, Ecology, Public health, Sources, Technology, Water pollution, Air pollution, Toxicology, Exposure, Industrial hygiene, Concentration(Composition), Economics, Solid waste disposal

Identifiers: *Ether/bis(chloromethyl), *Butadiene/hexachloro, *Polychlorinated biphenyls, *Biphenyl/perchloro, *Methane/fluoro-trichloro, Freon 11, Freon 12, NTISEPADTS

PB-290 711/1ST NTIS Prices: PC A03/MF A01

Effects of Polychlorinated Biphenyl Compounds and Proposed PCB-Replacement Products on Embryo-Larval Stages of Fish and Amphibians

Kentucky Water Resources Research Inst., Lexington.;*Office of Water Research and Technology, Washington, DC.

AUTHOR: Birge, Wesley J.; Black, Jeffrey A.; Westerman, Albert G.
Research rept.
F08941 Fld: 6T, 6F, 57Y, 68D GRAI7911
1978 44p
Rept No: RR-118
Contract: DI-14-34-0001-7037, DI-14-34-0001-7038
Project: DWRT-A-087-KY
Monitor: DWRT-A-087-KY(1)

Descriptors: *Toxicology, *Fishes, *Amphibia, Oxygen organic compounds, Bioassay, Chlorine organic compounds, Concentration(Composition), Lethal dosage, Toxicity, Embryos, Larvae, Growth, Experimental data, Sensitivity, Silicones, Frogs, Toads

Identifiers: *Water pollution effects(Animals), *Polychlorinated biphenyls, Biphenyl/perchloro, Teratogenesis, *Toxic substances, Rainbow trout, Salmo gairdneri, Channel catfish, Fowlers toad, Bufo fowleri, American toad, Bufo americanus, Phthalic acid/dioctyl, Phthalic acid/diisononyl, Ictalurus punctatus, Goldfish, Carassius auratus, Redear sunfish, Lepomis microlophus, Leopard frog, Rana pipiens, NTISDIOWRF

PB-291 246/9ST NTIS Prices: PC A03/MF A01

Environmental Assessment of Polychlorinated Biphenyls (PCBs) Near New Bedford, MA. Municipal Landfill

Environmental Science and Engineering, Inc., Gainesville, FL.;Environmental Protection Agency, Washington, DC. Office of Toxic Substances.

AUTHOR: Stratton, Charles L.; Tuttle, Karen L.; Allen, J. Mark
Research rept. no. 4 (Final)
FO5E3E1 Fld: 13B, 68A, 68D, 91A GRAI7909
26 May 78 48p
Contract: EPA-68-01-3268
Monitor: EPA/600/6-78/006

Descriptors: *Water pollution, *Solid waste disposal, *Earth fills, *Air pollution, *Urban areas, Surveys, Aromatic hydrocarbons, Ground water, Surface waters, Concentration(Composition), Soil analysis, Sediments, Streams, Aquatic animals, Sumner, Potable water, Massachusetts, Chlorine aromatic compounds

Identifiers: *Biphenyl/perchloro, *Polychlorinated biphenyls, Bedford(Massachusetts), *Path of pollutants, Aroclor 1242, Aroclor 1016, Aroclor 1254, NTISEPA0TS

PB-289 084/8ST NTIS Prices: PC A02/MF A01

Partitioning of Selected Polychlorinated Biphenyls in Natural Sediments

Environmental Research Lab., Athens, GA.

AUTHOR: Steen, W. C.; Paris, D. F.; Baughman, G. L.
Journal article
FO87M4 Fld: 7D, 8H, 68E, 68D, 99F, 48G GRAI7909
1978 9p
Rept No: EPA/600/J-78/084
Monitor: 18
Pub. in Water Research, v12(9), p655-657 1978.

Descriptors: *Sediments, *Water pollution, *Pesticides, *Water chemistry, Chlorine organic compounds, Adsorption, Carbon, Particle size distribution, Transport properties

Identifiers: *Polychlorinated biphenyls, *Biphenyl/perchloro, Aroclor 1016, Reprints, Aroclor 1242, Biphenyl/tetrachloro, *Path of pollutants, NTISEPA0BD

PB-288 484/9ST NTIS Prices: PC A07/MF A01

Follow-Up Study of the Distribution and Fate of Polychlorinated Biphenyls and Benzenes in Soil and Ground Water Samples After an Accidental Spill of Transformer Fluid

Environmental Protection Agency, Atlanta, GA. Region IV.

AUTHOR: Nosin, George J.; Smith, Al J.; Bigland, Kenneth E.; Loy, Bill; Bennett, Tom
FO44L1 Fld: 13B, 68 GRAI7906
Jan 78 145p
Rept No: EPA/904/9-78/014
Monitor: 18

Descriptors: *Insulating oil, *Benzene, Chlorine organic compounds, Transport properties, Field tests, Concentration(Composition), Environmental surveys, Leaching, Ground water, Soil analysis, Sampling, Water analysis, Sediments, Gas chromatography, Mass spectroscopy, Chemical analysis

Identifiers: *Polychlorinated biphenyls, *Hazardous materials spills, Biphenyl/perchloro, Land pollution, Aroclor 1254, Path of pollutants, NTISEPAL, NTISEPA0WP

PB-288 410/4ST NTIS Prices: PC A07/MF A01

A Method for the Sampling and Analysis of Polychlorinated Biphenyls (PCBs) in Ambient Air

Environmental Science and Engineering, Inc., Gainesville, FL.;Environmental Protection Agency, Washington, DC. Office of Toxic Substances.

AUTHOR: Stratton, Charles L.; Whitlock, Stuart A.; Allen, J. Mark
Final rept. Aug 75-Dec 77
FO3B3E1 Fld: 7D, 68A, 99A GRAI7905
Aug 78 150
Contract: EPA-68-01-2978
Monitor: EPA/600/4-78/048

Descriptors: *Gas analysis, Chlorine organic compounds, Chemical analysis, Sampling, Air pollution, Concentration(Composition), Field tests, Gas chromatography

Identifiers: *Polychlorinated biphenyls, *Air pollution detection, Biphenyl/perchloro, Aroclor 1016, Aroclor 1242, Procedures, NTISEPA0B0

PB-266 605/2ST NTIS Prices: PC A02/MF A01

PCB Concentrations in Striped Bass and Eggs

Westinghouse Ocean Research Lab., Annapolis, MD.;Environmental Protection Agency, Philadelphia, PA. Chesapeake Bay Program.

AUTHOR: Ferno, Joseph H.
Final rept. 19 Apr-15 Jul 76
PC04184 Fld: 6F, 68E, 68D GRAI7905
Jul 76 12p
Monitor: EPA/903/9-78/019

Descriptors: *Herbicides, *Pesticides, *Fishes, *Chesapeake Bay, Tables(Data), Concentration(Composition), Females, Eggs, Chlorine organic compounds, Chemical analysis, Water pollution, James River, Sampling, Preparation, Nanticoke River, Choptank River, Elk River, Potomac River, Rappahannock River

Identifiers: Bioaccumulation, *Polychlorinated biphenyls, Striped bass, NTISEPAL

PB-266 699/4ST NTIS Prices: PC A02/MF A01

Analysis for Polychlorinated Biphenyls in Lake Macatawa Bottom Sediments

Michigan State Univ., East Lansing. Inst. of Water Research.;Hope Coll., Holland, MI. Dept. of Chemistry.;Office of Water Research and Technology, Washington, DC.

AUTHOR: Brink, Irvin J.
Completion rept.
PC01902 Fld: 7D, 68D, 98A GRAI7902
Jun 78 19p
Contract: DI-14-31-0001-6023
Project: GWRT-A-087-MICH
Monitor: GWRT-A-087-MICH(1)
Prepared by Hope Coll., Holland, MI. Dept. of Chemistry.

Descriptors: *Chemical analysis, *Lake Macatawa, *Sediments, *Pesticides, Chlorine organic compounds, Concentration(Composition), Samples, Earth fills, Water pollution, Water analysis, Sites

Identifiers: *Polychlorinated biphenyls, *Water pollution detection, Point sources, Biphenyl/perchloro, NTISDIGWRT

PB-266 383/7ST NTIS Prices: PC A03/MF A01

Polychlorinated Biphenyls in Precipitation in the Lake Michigan Basin

De Paul Univ., Chicago, IL.;Environmental Research Lab.-Duluth, Grosse Ile, MI. Large Lakes Research Station.

AUTHOR: Murphy, Thomas J.; Rzeszutko, Charles P.
Final rept.
PC14461 Fld: 13B, 68D, 68A GRAI7902
Jul 78 42p
Grant: EPA-803015
Monitor: EPA/600/3-78/071

Descriptors: *Air pollution, *Water pollution, *Lake Michigan, Chlorine organic compounds, Hydrology, Concentration(Composition), Earth fills, Pesticides, Sampling, Chemical analysis, Particles, Rain

Identifiers: *Polychlorinated biphenyls, Air water interfaces, Biphenyl/perchloro, NTISEPAORD

PB-266 010/4ST NTIS Prices: PC A03/MF A01

Polychlorinated Biphenyls, Chlorinated Pesticides and Trace Metals in Soils of the Everglades National Park and Adjacent Agricultural Areas

National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs. (406 368)

AUTHOR: Boquejo, Adolfo G.; West, Richard H.; Harvey, George R.; Hatcher, Patrick G.; McGillivary, Philip A.
Technical memo.
E2611M2 Fld: 13B, 6F, 68D, 57P, 66D GRAI7824
Oct 77 46p
Dept Nof NOAA-TM-ERL-AOML-32
Monitor: NOAA-78060704

Descriptors: *Biphenyl, *Metals, *Water pollution, *Pesticides, Sampling, Soils, Farms, Chlorohydrocarbons, Sources, Copper, Concentration(Composition), Chlordan, DDT, Chlorine organic compounds, Halohydrocarbons, National parks, Agriculture, Plastics, Mulches, Florida

Identifiers: Everglades National Park, *Polychlorinated biphenyls, Biphenyl/chloro, Path of pollutants, NTISCOMNOA

PB-284 378/7ST NTIS Prices: PC A02/MF A01

Monitoring for Polychlorinated Biphenyl Emissions from an Electrolytic Capacitor Disposal Project

Environmental Monitoring and Support Lab., Research Triangle Park, N.C. Environmental Monitoring Branch.

AUTHOR: Rodes, Charles E.; Jackson, Merrill D.; Lewis, Robert G.
Field project rept.
E2S0D0 Fld: 7D, 68C, 68A, 98A GRAI7824
May 78 23p
Rept No: EPA/600/4-78-025
Monitor: 1B
Prepared in cooperation with Health Effects Research Lab., Research Triangle Park, N.C. Environmental Toxicology Div.

Descriptors: *Solid waste disposal, *Gas analysis, Industrial wastes, Chlorine organic compounds, Air pollution, Combustion products, Capacitors, Chemical analysis, Concentration(Composition), Monitoring

Identifiers: *Air pollution detection, Aroclor 1242, Biphenyl/chloro, *Polychlorinated biphenyls, NTISEPA0RD

PB-289 323/4ST NTIS Prices: Not available NTIS

Effects of Polychlorinated Biphenyls, Polychlorinated Naphthalenes, and Phthalate Esters on Larval Development of the Red Crab 'Chiltrapanopeus harrisii'

Texas A and M Univ., College Station.*National Science Foundation, Washington, D.C. Office for the International Decade of Ocean Exploration. (347 350)

AUTHOR: Laughlin, R. B. Jr; Neff, J. M.; Glem, C. S.
E2371E4 Fld: 6F, 13B, 6T, 8A, 68D, 57H, 57V, 47D GRAI7822
1977 11p
Grant: NSF-IDOTS-04880, NSF-0CE73-09743-A04
Monitor: NSF/IDOE-78/78
Pub. in Pollutant Effects on Marine Organisms, p95-110 1977.

Descriptors: *Crabs, *Water pollution, *Toxicity, Chlorine organic compounds, Biphenyls, Larvae, Chlorine, Reproduction(Biology), Exposure, Concentration(Composition), Naphthalenes, Phthalates, Esters, Aquatic animals

Identifiers: International Decade of Ocean Exploration, *Polychlorinated biphenyls, Biphenyl/chloro, *Chiltrapanopeus harrisii, Water pollution effects(Animals), Aroclor 1016, *Polychlorinated naphthalenes, Halowax 1000, Halowax 1099, NTISIDOE

PB-283 090/9ST NTIS Prices: PC A02/MF A01

Polychlorinated Biphenyls in the Nearshore Marine Ecosystem off San Diego, California

Southern California Coastal Water Research Project, El Segundo.*California Regional Water Quality Control Board, San Diego. San Diego Region.

AUTHOR: Young, David R.; Heesen, Theodore C.
Final rept. Dec 76-Jul 77
E2363D2 Fld: 13B, 68D GRAI7822
1 Sep 77 21p
Rept No: SCCWRP-109
Monitor: 1B

Descriptors: *Biphenyls, *Waste water, *Water pollution, Chlorine organic compounds, Harbors, Outfall sewers, Crabs, Tissues(Biology), Contamination, Concentration(Composition), Sediments, Mussels, Fishes, DDT, California

Identifiers: *Polychlorinated biphenyls, *San Diego Harbor, NTISSOL8

PB-283 178/2ST NTIS Prices: PC A06/MF A01

Evaluation of the Problem Posed by In-Place Pollutants in Baltimore Harbor and Recommendation of Corrective Action

Trident Engineering Associates, Inc., Annapolis, Md.;*Maryland Univ., Cambridge. Horn Point Environmental Labs.*Environmental Protection Agency, Washington, D.C. Office of Water Planning and Standards. (404 032)
Final rept.
E2112J2 Fld: 8J, 68D, 47C GRAI7820
Sep 77 87p
Contract: EPA-68-01-1965
Monitor: EPA/440/5-77/015B
Prepared in cooperation with Maryland Univ., Cambridge. Horn Point Environmental Labs.

Descriptors: *Water pollution control, *Baltimore Harbor, *Sediments, Maryland, Bioassays, Toxicity, Feasibility, Fishes, Benthos, Cost analysis, Concentration(Composition), Plankton, Sites, Metals, Hexane, Chlorine organic compounds, Maryland

Identifiers: *Water pollution sampling, *Water quality, Polychlorinated biphenyls, NTISEPA0WS

PB-282 574/2ST NTIS Prices: PC A11/MF A01

Evaluation of the Problem Posed by In-Place Pollutants in Baltimore Harbor and Recommendation of Corrective Action - Appendices

Trident Engineering Associates, Inc., Annapolis, Md.;*Maryland Univ., Solomons. Center for Environmental and Estuarine Studies.;*Environmental Protection Agency. Washington, D.C. Office of Water Planning and Standards. (404 092)
E2908J4 Fld: 13B, 6J, 8A, 68D, 47D, 47C GRAI7820
Sep 77 239p
Contract: EPA-68-01-1985
Monitor: EPA/440/5-77/018A
Prepared in cooperation with Maryland Univ., Solomons. Center for Environmental and Estuarine Studies.

Descriptors: *Sediments, *Water pollution, *Monitoring, Stream flow, Runoff, Circulation, Ocean currents, Bathymetry, Sediments, Cores, Sampling, Particle size, Arsenic, Mercury(Metal), Cadmium, Chromium, Copper, Manganese, Nickel, Lead(Metal), Zinc, Pesticides, Concentration(Composition), Invertebrates, Fishes, Bioassay

Identifiers: *Baltimore Harbor, Polychlorinated biphenyls, Biphenyl/chloro, Species diversity, NTISEPA08S

PB-282 367/2ST NTIS Prices: PC A02/MF A01

Role of Physico-Chemical Properties of Aroclors 1016 and 1242 in Determining Their Fate and Transport in Aquatic Environments

Environmental Research Lab., Athens, Ga.

AUTHOR: Perle, Doris F.; Steen, William C.; Baughman, George L.
Journal article
E1983L3 Fld: 6F, 7D, 68E, 68D, 99A, 97F GRAI7819
1978 8
Rept No: EPA/600/J-78-014
Monitor: IB
Pub. in Chemosphere v7 n4, p319-328, 1978.

Descriptors: *Pesticides, *Water analysis, Chlorine organic compounds, Chemical analysis, Gas chromatography, Sorption, Vaporizing, Solubility, Concentration(Composition), Reaction kinetics

Identifiers: *Aroclor 1016, *Aroclor 1242, *Path of pollutants, *Water pollution detection, Reprints, Polychlorinated biphenyls, NTISEPA08D

PB-281 009/1ST NTIS Prices: PC A04/MF A01

Size Dependent Model of Hazardous Substances in a Aquatic Food Chain

Manhattan Coll., Bronx, N.Y.;*Environmental Research Lab.,-Duluth, Minn.

AUTHOR: Thomann, Robert V.
E1743J4 Fld: 13B, 6F, 68D, 57H GRAI7817
Apr 78 51p
Contract: EPA-R-803680
Monitor: EPA/600/3-78/038

Descriptors: *Hazardous materials, *Water pollution, *Lakes, Mathematical models, Food chains, Marine microorganisms, Fishes, Size determination, Bioassay, Absorption, Biomass, Excretion, Biphenyl, Hydrocarbons, Concentration(Composition), Accumulation, Lake Ontario

Identifiers: Biphenyl/chloro, Polychlorinated biphenyls, NTISEPA08D

PB-280 893/9ST NTIS Prices: (Order as PB-280 889, MF A01)

A Comparative Study of Two Polychlorinated Biphenyl Mixtures (Aroclors 1242 and 1016) Containing 42% Chlorine on Induction of Hepatic Porphyria and Drug Metabolizing Enzymes

National Environmental Research Center, Research Triangle Park, N.C.

AUTHOR: Goldstein, Joyce A.; Hickman, Patricia; Bursa, Virlyn V.; Bergman, Hindo
E1741I1 Fld: 6T, 57Y, 68G, 68E GRAI7817
27 Nov 74 14p
Monitor: IB
Pub. in Toxicology and Applied Pharmacology 32, p461-473 1975.
Included in the report, Journal Articles on Toxicology, Group 14, PB-280 889.

Descriptors: *Pesticides, *Toxicology, Bioassay, Laboratory animals, Chlorine organic compounds, Rats, Ingestion(Biology), Metabolism, Liver, Porphyria, Metabolic diseases, Enzymes, Drug, Physiological effects, Experimental data, Comparison, Concentration(Composition), Tables(Data)

Identifiers: *Polychlorinated biphenyls, Reprints, Aroclor 1016, *Toxic substances, Aroclor 1242, Biological effects, Bioaccumulation, Pesticide residues, Biphenyl/chloro, NTISEPA1

PB-280 110/1ST NTIS Prices: PC A10/MF A01

Burning Waste Chlorinated Hydrocarbons in a Cement Kiln

Environmental Protection Service, Montreal (Quebec).*Environmental Protection Agency, Washington, D.C. Office of Solid Waste.

AUTHOR: McDonald, L. D.; Skinner, D. J.; Hopton, F. J.; Thomas, G. H.
Final rept.
E16340I2 Fld: 13B, 68A, 68E, 68C GRAI7815
Jan 78 221p
Contract: EPA-68-01-2966
Monitor: EPA/530/SW-147C

Descriptors: *Air pollution, *Chlorine organic compounds, *Incinerators, Pesticides, Particles, Chlorofors, Carbon tetrachloride, Concentration(Composition), Kilns, Performance evaluation

Identifiers: *Liquid waste disposal, Toluene/chloro, Mississauga(Ontario), Polychlorinated biphenyls, Ethylene/dichloro, NTISEPASW

PB-279 750/4ST NTIS Prices: (Order as PB-279 730, MF A01)

Polychlorinated Biphenyls (Aroclor 1242): Effects of Uptake on E. coli Growth

Medical Univ. of South Carolina, Charleston. (092 550)

AUTHOR: Kell, Julian E.; Graber, Charles D.; Priester, Lamar E.; Sandifer, Samuel H.
E1471L2 Fld: 6T, 6M, 57Y, 57K, 68G, 68E GRAI7815
1972 3p
Monitor: IB
Pub. in Environmental Health Perspectives, nl p175-177, Apr 72.
Included in the report, Journal Articles on Toxicology. Group 8, PB-279 730.

Descriptors: *Pesticides, *Toxicology, Metabolism, Bacteria, Escherichia coli, Chlorine organic compounds, Growth, In vitro analysis, Tables(Data), Experimental data, Microorganisms, Concentration(Composition), DDT

Identifiers: Reprints, *Polychlorinated biphenyls, *Aroclor 1242, *Toxic substances, NTISEPAL

PB-279 713/2ST NTIS Prices: (Order as PB-279 700, MF A01)

DDT and Polychlorinated Biphenyl (Aroclor 1242(Trade Name)) Effects of Uptake on E. Coli Growth

Medical Univ. of South Carolina, Charleston. (405 442)

AUTHOR: Kell, J. E.; Sandifer, S. H.
E1471M2 Fld: 6F, 6T, 6M, 57K, 57Y, 68E, 57H GRAI7815
1 Feb 72 7p
Monitor: IB
Pub. in Water Research, v6 p837-841 1972.
Included in the report, Journal Articles on Toxicology Group 7, PB-279 700.

Descriptors: *DDT, *Pesticides, Biodeterioration, Growth, Bacteria, Escherichia coli, In vitro analysis, Tables(Data), Insecticides, Residues, Nucleic acids, Uridine, Concentration(Composition), Experimental data, Metabolism, Chlorine organic compounds

Identifiers: Reprints, *Polychlorinated biphenyls, DDT insecticide, DDE insecticide, Pesticide residues, Arochlor 1242, Arochlors, NTISEPAL

PB-279 610/0ST NTIS Prices: PC A02/MF A01

A Modified Perchlorination Procedure for the Determination of Polychlorinated Biphenyls

Wisconsin Univ., Madison. Water Resources Center.*Office of Water Research and Technology, Washington, D.C.

AUTHOR: Burkhard, L. P.; Armstrong, D. E.
Technical completion rept.
E1465C4 Fld: 7D, 68E, 68D, 99A GRAI7815
1978 25
Rept No: WIS-WRC-78-01
Contract: 01-14-34-0001-6052, DI-14-34-0001-7106
Project: GWRI-A-067-WIS
Monitor: GWRI-A-067-WIS(1)

Descriptors: *Water analysis, *Pesticides, Chlorine compounds, Chemical analysis, Concentration(Composition), Water pollution, Chlorination

Identifiers: *Polychlorinated biphenyls, *Aroclors, *Water pollution detection, Aroclor 1221, Aroclor 1254, NTISDIOWRI

PB-279 547/4ST NTIS Prices: PC A09/MF A01

Organic Analyses in Water Quality Control Programs. Training Manual

National Training and Operational Technology Center, Cincinnati, Ohio.
E146652 Fld: 7D, 68D*, 98A*, 68E GRAI7815
Dec 77 193pp
Rept No: EPA/430/1-77/014
Monitor: 18
Supersedes PB-261 200, PB-261 318, PB-224 212 and PB-238 893.

Descriptors: *Water analysis, *Manuals, *Organic compounds, Chemical analysis, Dissolved gases, Oxygen, Biochemical oxygen demand, Ammonia, Organic nitrates, Carbon, Surfactants, Phenols, Oils, Greases, Gas chromatography, Chlorine organic compounds, Concentration(Composition), Nitrogen organic compounds, Nitrites, Photometry, Pesticides, Quality assurance, Numerical analysis

Identifiers: Chemical oxygen demand, Polychlorinated biphenyls, *Water pollution detection, Winkler test, Kjeldahl method, *Water quality, NTISEPAGWP

PB-279 130/0ST NTIS Prices: PC A04/MF A01

Laboratory Evaluation of High-Temperature Destruction of Polychlorinated Biphenyls and Related Compounds

Dayton Univ., Ohio. Research Inst.*Municipal Environmental Research Lab., Cincinnati, Ohio.

AUTHOR: Duvall, D. S.; Rubey, W. A.
E136393 Fld: 14B, 6F, 57P, 98A GRAI7814
Dec 77 74p
Grant: EPA-R-803640
Monitor: EPA/600/2-77/226

Descriptors: *Pesticides, *Chlorine organic compounds, Laboratory equipment, Experiments, Degradation, Stability, Pyrolysis, Gas chromatography, Design criteria, Chemical analysis

Identifiers: *Polychlorinated biphenyls, Quartz tube apparatus, Procedures, High temperature, NTISEPAGRD

PB-279 963/6ST NTIS Prices: PC A03/MF A01

Industrial Hygiene Survey of Aerovox Industries, Inc., New Bedford, Massachusetts

National Inst. for Occupational Safety and Health, Cincinnati, Ohio. Industrywide Studies Branch.

AUTHOR: Phillips, Bob; Smith, Larry; Jones, Mark
E136544 Fld: 6J, 6F, 57U, 57Y, 94D, 68G GRAI7814
29 Nov 77 30p
Monitor: 18

Descriptors: *Environmental surveys, *Industrial hygiene, *Electrical industry, Chlorine organic compounds, Lead poisoning, Tin, Zinc, Air pollution, Industrial atmospheres, Toxicology, Concentration(Composition), Standards, Physiological effects, Recommendations, Tables(Data), Massachusetts

Identifiers: Indoor air pollution, *Polychlorinated biphenyls, Aroclor 1016, Ethylene/trichloro, *Occupational safety and health, Aerovox Industries Incorporated, New Bedford(Massachusetts), *Toxic substances, Air sampling, Maximum permissible exposure level, Threshold limit values, NTISHEWOSH

PB-278 803/2ST NTIS Prices: PC A02/MF A01

Industrial Hygiene Survey of Westinghouse Electric Corporation, Bloomington, Indiana

National Inst. for Occupational Safety and Health, Cincinnati, Ohio. Div. of Surveillance, Hazard Evaluation and Field Studies.

AUTHOR: Jones, Mark
E136314 Fld: 6J, 57U, 94D, 68G, 68A, 68E GRAI7814
1 Dec 77 23p
Monitor: 18

Descriptors: *Industrial hygiene, *Environmental surveys, *Chemical industry, Pesticides, Chlorine organic compounds, Air pollution, Industrial plants, Concentration(Composition), Industrial atmospheres, Hazards, Personnel, Health, Indiana, Solvents, Fumes, Ozone, Preventive medicine, Safety engineering, Standards

Identifiers: *Occupational safety and health, Indoor air pollution, Air sampling, Environmental health, *Toxic substances, Westinghouse Electric Corporation, Bloomington(Indiana), *Polychlorinated biphenyls, Threshold limit values, Maximum permissible exposure level, *Aroclor 1016, NTISHEWOSH

PB-277 474/2ST NTIS Prices: Not available NTIS

Inputs of Organic Matter to the Ocean

Rhode Island Univ., Kingston. Graduate School of Oceanography.;*Delta Inst. of Hydrobiological Research, Yerseke (Netherlands).;National Science Foundation, Washington, D.C. Office for the International Decade of Ocean Exploration. (408 000)

AUTHOR: Duce, Robert A.; Duursma, Egbert K.
E10040G Fld: 13B, 8A, 68D, 47D GRAI7811
11 May 77 22p
Grant: NSF-GX-33777, NSF-OCE76-16033
Monitor: NSF/IDOE-78/3
Prepared in cooperation with Delta Inst. of Hydrobiological Research, Yerseke (Netherlands).
Pub. in Marine Chemistry, v5 p319-339 1977.

Descriptors: *Ocean environments, *Primary biological productivity, *Water pollution, Photosynthesis, Carbon, Biphenyl, Chlorine organic compounds, Concentration(Composition), Surface waters, Photochemical reactions

Identifiers: Reprints, International Decade of Ocean Exploration, Polychlorinated biphenyls, NTISIDOE

PB-277 149/1ST NTIS Prices: PC A02/MF A01

Organic Contaminants - Lake Huron

Environmental Research Lab.-Duluth, Minn.

AUTHOR: Glass, G. E.; Strachan, W. M. J.; Willford, W. A.; Armstrong, F. A. J.; Kaiser, K. L. E.
E08056J Fld: 13B, 68D, 68E GRAI7810
1977 30p
Rept No: EPA/600/J-77/063
Monitor: 18
Pub. in The Waters of Lake Huron and Lake Superior, v2 Pt8, Lake Huron, Georgian Bay, and the North Channel; ch6.4 p577-680, 667-670 1977. Report to the International Joint Commission-United States and Canada, Windsor (Ontario) by Upper Lakes Reference Group of Working Group C.

Descriptors: *Organic compounds, *Lake Huron, Chlorobenzenes, Aromatic polycyclic hydrocarbons, Phenols, Water pollution, Water analysis, Chemical analysis, Odors, Chlorine organic compounds, Cyanides, Chlordan, Dieldrin, Aldrin, Pesticides, DDT, Concentration(Composition), Sediments, Limnology, Sources, Phthalates, Norbornenes, Biphenyls, Bromine organic compounds, Fishes

Identifiers: Reprints, *Water pollution detection, Polychlorinated biphenyls, DDD insecticide, DDE insecticide, Biphenyl/hexabromo, Endosulfan, Heptachlor epoxide, Benzene/hexachloro, Lindane, Methoxychlor, Styrene/octachloro, Cyclohexane/hexachloro-methyl, Water pollution effect(animals), NTISEPA600

PB-278 849/7ST NTIS Prices: PC A11/MF A01

Criteria for a Recommended Standard....Occupational Exposure to Polychlorinated Biphenyls (PCBs)

National Inst. for Occupational Safety and Health, Cincinnati, Ohio. (390 766)
E08056.1 Fld: 6J, 6T, 57U, 57Y, 94D, 68G GRAI7809
Sep 77 234p
Rept No: DHEW/PUB/NIOSH-77/225
Monitor: 18

Descriptors: *Industrial hygiene, Air pollution, Industrial atmospheres, Chlorine organic compounds, Criteria, Standards, Recommendations, Concentration(Composition), Physiological effects, Preventive medicine, Safety engineering, Medical examination, Monitors, Records management, Protection, Personnel, Toxicology, Laboratory animals, Bioassay, Environmental surveys

Identifiers: Occupational Safety and Health Act of 1970, *Polychlorinated biphenyls, *Biphenyl/chloro, Threshold limit values, Maximum permissible exposure level, Carcinogenesis, Mutagenesis, Teratogenesis, Air sampling, *Toxic substances, Biological effects, NTISHEWOSH

PB-276 333/2ST NTIS Prices: (Order as PB-276 326, MF A01)

Organochlorine Pesticide Residues in Human Adipose Tissue

Environmental Protection Agency, Washington, D.C. (380 120)

AUTHOR: Hutz, P. W.; Yobs, A. R.; Strassman, S. C.
EOTO1J3 Fld: 6F, 8T, 68G, 68E, 57Y GRAI7808
1976 3p
Monitor: 18
Pub. in the Bulletin of the Society of Pharmacological and Environmental Pathologists, v4 n1 p17-19, Mar 76.
Included in the report, Journal Articles on Pesticide Content in Food and Man, PB-276 326.

Descriptors: *Pesticides, *Body fat, *Chlorine organic compounds, Tissues(Biology), Surveys, Insecticides, Sampling, Chemical analysis, Pathology, Tables(Data), Heptachlor, Concentration(Composition), DDT, Dieldrin, Chlorine organic compounds

Identifiers: *Pesticide residues, Reprints, *Adipose tissue, Polychlorinated biphenyls, Benzene/hexachloro, Oxychlordane, *Toxic substances, NTISEPAL

PB-276 330/8ST NTIS Prices: (Order as PB-276 326, MF A01)

Levels of Polychlorinated Biphenyls in Adipose Tissue of the General Population of the Nation

Environmental Protection Agency, Chamblee, Ga.

AUTHOR: Yobs, Anna R.
EOTO1I4 Fld: 6F, 8T, 68G, 68E, 57Y GRAI7808
Apr 72 3p
Monitor: 18
Pub. in Environmental Health Perspectives, n1 p79-81, Apr 72.
Included in the report, Journal Articles on Pesticide Content in Food and Man, PB-276 326.

Descriptors: *Body fat, *Pesticides, Tissues(Biology), Chlorine organic compounds, Humans, Sampling, Detection, Tables(Data), Concentration(Composition), Surveys, Monitors, Mass spectroscopy, Pathology, United States

Identifiers: *Pesticide residues, Adipose tissue, *Polychlorinated biphenyls, Reprints, Toxic substances, NTISEPAL

PB-276 313/4ST NTIS Prices: (Order as PB-276 313, MF A01)

Polychlorinated Biphenyls in the Surface Waters and Bottom Sediments of the Major Drainage Basins of the United States

Environmental Protection Agency, Washington, D.C. Office of Pesticide Programs.

AUTHOR: Dennis, O. Steve
EOTO1E4 Fld: 6F, 13B, 57H, 68E GRAI7808
1974 12p
Monitor: 18
Pub. in unidentified jnl.
Included in the report, Journal Articles on Pesticide Residues in the Environment, Group 2, PB-276 312.

Descriptors: *Residues, *Biphenyls, *Pesticides, Monitoring, Chlorine organic compounds, Surface waters, Sediments, Concentration(Composition), Hazards, Rivers, Streams, Watersheds, United States, Puerto Rico

Identifiers: *Polychlorinated biphenyls, Biphenyl/chloro, *Pesticide residues, NTISEPAL

PB-275 994/2ST NTIS Prices: (Order as PB-275 989, MF A01)

Baseline Concentrations of Polychlorinated Biphenyls and DDT in Lake Michigan Fish, 1971

National Water Quality Lab., Duluth, Minn.

AUTHOR: Veith, Gilson D.
EOG93C2 Fld: 6F, 68E, 68D, 57Z, 57H GRAI7808
1975 9p
Monitor: 18
Pub. in Pesticides Monitoring Jnl., v9 n1 p21-29, Jun 75.
Included in the report, Journal Articles on Pesticide Residues in the Environment, Group 1, PB-275 989.

Descriptors: *Fishes, *Biphenyls, *DDT, *Lake Michigan, *Pesticides, Chlorine organic compounds, Aromatic compounds, Hazards, Monitoring, Concentration(Composition), Trout, Salmon, Fresh water fishes, Tolerances(Physiology), Water quality, Residues

Identifiers: Reprints, *Polychlorinated biphenyls, Biphenyl/chloro, *Pesticide residues, NTISEPAL

PB-276 042/9ST NTIS Prices: PC A03/MF A01

Ambient Concentrations of PCBs in the Southeast from STORET Data and Selected EPA Studies

Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.

AUTHOR: Bruner, R. J. III; Hill, David W.
Final rept.
EOS1284 Fld: 6F, 68E, 68D, 57H GRAI7807
Oct 77 39p
Rept No: EPA/904/9-77/032
Monitor: 10

Descriptors: *Fishes, *Chemical analysis, Aquatic animals, Tissues(Biology), Concentration(Composition), Water pollution, Water analysis, Lake Wateree, Lake Hartwell, Residues, Sediments, Samples, Monitoring, Pesticides, North Carolina, South Carolina, Alabama, Tennessee, Kentucky, Mississippi, Georgia, Florida, Big Cypress Swamp

Identifiers: *Polychlorinated Biphenyls, *Water quality, *Water pollution detection, Bioaccumulation, *Pesticide residues, Southeast region(United States), NTISEPAL

PB-275 964/2ST NTIS Prices: PC A06/MF A01

Availability and Concentration of Pollutants from American Falls Reservoir Sediments to Forage and Predaceous Fishes

Idaho Univ., Moscow. Water Resources Research Inst.;*Idaho State Univ., Pocatello.*Office of Water Research and Technology, Washington, D.C.

AUTHOR: Johnson, Donald W.; Kent, James C.; Campbell, Donald H.
Technical completion rept. Jul 74-Jul 75
EOS0112 Fld: 13B, 6F, 68E, 57H GRAI7807
Mar 77 103p
Contract: DI-14-34-0001-6013
Project: OWRT-A-043-IDA
Monitor: OWRT-A-043-IDA(2)
Prepared by Idaho State Univ., Pocatello.

Descriptors: *Metals, *Reservoirs, *Fishes, *Pesticides, *Water pollution, Chlorine organic compounds, Chlorohydrocarbons, Residues, Dieldrin, DDT, Biphenyl, Mercury(Metal), Cadmium, Trout, Fresh water fishes, Marine microorganisms, Concentration(Composition), Environmental impacts, Arsenic, Halohydrocarbons, Idaho

Identifiers: *American Falls Reservoir, Biphenyl/chloro, Polychlorinated Biphenyls, NTISOWRT

PB-275 668/2ST NTIS Prices: PC A07/MF A01

Evaluation of Collection Media for Low Levels of Airborne Pesticides

Southwest Research Inst., San Antonio, Tex.;Health Effects Research Lab., Research Triangle Park, N.C. (328 200)

AUTHOR: Rhoades, John W.; Johnson, Donald E.
EOS1281 Fld: 14B, 68A, 99A GRAI7806
Oct 77 140p
Contract: EPA-68-02-2235
Monitor: EPA/600/1-77/050
See also report dated May 72, PB-214 008.

Descriptors: *Pesticides, *Gas analysis, *Gas detectors, Concentration(Composition), Tables(Data), Gas chromatography, Chemical analysis, Concentration(Composition), Sampling, Performance evaluation, Design criteria, Foam, Polyurethane resins, Sorbents, Air pollution, Chlorine organic compounds, Organic phosphates, Carbamates, Samplers

Identifiers: *Air pollution detection, *Air pollution sampling, Polychlorinated Biphenyls, Chromosorb 102, Tenax-GC resins, NTISEPAORD

PB-278 413/2ST NTIS Prices: PC A03/MF A01

Inputs and Distributions of Chlorinated Hydrocarbons in Three Southern California Harbors

Southern California Coastal Water Research Project, El Segundo.

AUTHOR: Young, David R.; Heesen, Theodore C.
Technical rept. 1972-74
EOSOSK1 Fld: 13B, 8A, 6F, 60E*, 47D*, 57H, 68D GRAI7606
Jun 74 31p*
Rept No: SCCWRP-TM214-74
Monitor: 18

Descriptors: *Chlorohydrocarbons, *DDT, *Water pollution, *Harbors, Waste water, Industries, Municipalities, Antifouling coatings, Biphenyls, Runoff, Merchant ships, Residues, Chlorine organic compounds, Halohydrocarbons, Concentration(Composition), Mussels, Animal ecology, Distribution(Property), California

Identifiers: Los Angeles Harbor, Long Beach Harbor, Newport Harbor, San Diego Harbor, *Polychlorinated biphenyls, Biphenyl/chloro, NTISSOLO

PB-278 412/9ST NTIS Prices: PC A02/MF A01

Marine Inputs of Polychlorinated Biphenyls and Copper from Vessel Antifouling Paints

Southern California Coastal Water Research Project, El Segundo.

AUTHOR: Young, David R.; Heesen, Theodore C.; McDermott, Deirdre J.; Soehler, Paul E.
EOSOSJ4 Fld: 13B, 8A, 6F, 60E*, 47D*, 57H, 68D GRAI7606
May 74 33p*
Rept No: SCCWRP-TM213-74
Monitor: 18

Descriptors: *Antifouling coatings, *Water pollution, *Marinas, *Copper, Chlorine organic compounds, Merchant ships, Concentration(Composition), Marine microorganisms, Ecology, Harbors, Mixtures, Environmental impacts, Harbors, California, Biphenyls

Identifiers: *Polychlorinated biphenyls, San Diego Harbor, Aroclor 1242, Long Beach Harbor, Los Angeles Harbor, Aroclor 1254, Biphenyl/chloro, NTISSOLO

PB-276 283/2ST NTIS Prices: PC A08/MF A01

Monitoring of Trace Constituents During PCB Recovery Dredging Operations: Duwamish Waterway

Environmental Protection Agency, Seattle, Wash. Surveillance and Analysis Div.

AUTHOR: Blazevich, Joseph N.; Gahler, Arnold R.; Vasconcelos, George J.; Black, Robert M.; Pepe, Stephen V. W.
EOSOSL3 Fld: 13B, 8H, 68D, 50B, 49G GRAI7606
Aug 77 154p
Rept No: EPA/910/9-77/039
Monitor: 18

Descriptors: *Biphenyls, *Water pollution, *Monitoring, *Duwamish River, Dredging, Chlorine organic compounds, Trace elements, Concentration(Composition), Recovery, Sediments, Spoil, pH, Metals, Conductivity, Performance evaluation, Transformers, Coliform bacteria, Nitrogen, Oxygen, Inorganic phosphates, Inorganic sulfides, Washington(State)

Identifiers: *Polychlorinated biphenyls, Pneuma dredges, Seattle(Washington), *Aroclor 1242, NTISEPAL

PB-274 660/7ST NTIS Prices: (Order as PB-274 846, MF A01)

Baseline Concentrations of Polychlorinated Biphenyls and DDT in Lake Michigan Fish, 1971

National Water Quality Lab., Duluth, Minn.*Wisconsin Univ., Madison. Dept. of Civil and Environmental Engineering.

AUTHOR: Veith, Gilman D.
EO414E4 Fld: 13B, 6F, 6C, 68E, 57H, 98F, 57Z GRAI7605
1975 9p
Monitor: 18
Pub. in Pesticides Monitoring Jnl., v9 n1 Jun 75. Sponsored in part by Wisconsin Univ., Madison. Dept. of Civil and Environmental Engineering.
Included in the report, Journal Articles on Pesticide Residues in Animals, PB-274 846.

Descriptors: *Fresh water fishes, *Residues, *DDT, *Lake Michigan, Biphenyls, Chlorine organic compounds, Concentration(Composition), Trout, Flatfishes, Weight(Mass/volume), Chlorohydrocarbons, Halohydrocarbons, Salmon, Toxic tolerances, Gas chromatography, Mass spectroscopy

Identifiers: *Pesticide residues, Reprints, *Polychlorinated biphenyls, Biphenyl/chloro, *Baseline studies, Bioaccumulation, NTISEPAL

PB-274 849/9ST NTIS Prices: (Order as PB-274 846, MF A01)

Organochlorine Residues in Starlings, 1972

Environmental Protection Agency, Washington, D.C. Criteria and Evaluation Div.;+Fish and Wildlife Service, Washington, D.C. Div. of Technical Assistance.

AUTHOR: Blakersen, Paul B.; Gerbohann, Kyle B.
EQ414E3 Fld: 13B, 6F, 8C, 68E, 57H, 57Z GRAI7806
1975 6p
Monitor: 18
Pub. in Pesticides Monitoring Jnl., v8 n4 p247-254 Mar 75. Prepared in cooperation with Fish and Wildlife Service, Washington, D.C. Div. of Technical Assistance. Included in the report, Journal Articles on Pesticide Residues in Animals, PB-274 846.

Descriptors: *Birds, *Residues, *Chlorine organic compounds, *Insecticides, Concentration(Composition), DDT, Dieldrin, Chlorine aliphatic compounds, Epoxy compounds, Chlorine aromatic compounds, Biphenyls, Chlordan, By products, States(United States), Sampling, Tables(Data)

Identifiers: *Pesticide residues, Reprints, Indanes, Methanoindanes, Methanoindene/heptachloro-tetrahydro, Benzene/-hexachloro, Biphenyl/chloro, Polychlorinated biphenyls, Chlordane/oxy, Bioaccumulation, NTISEPAL

PB-274 408/8ST NTIS Prices: PC A08/MF A01

Coastal Water Research Project Annual Report 1974

Southern California Coastal Water Research Project, El Segundo.
Interim rept. Jul 73-Jun 74.
EQ405C1 Fld: 13B, 6F, 8A, 68D, 57H, 47D GRAI7805
Sep 74 181p
Rept No: SCCWRP-AR1-74
Monitor: 18

Descriptors: *Marine biology, *Ecology, *Water pollution, *Coasts, Environmental impacts, Surveys, Metals, Waste water, DDT, Sediments, Sewage disposal, Biphenyl, Chlorohydrocarbons, Concentration(Composition), Harbors, North Pacific Ocean, Benthos, Merchant ships, Fishes, Animal diseases, Invertebrates, Outfall sewers, California

Identifiers: *Ocean waste disposal, *Biphenyl/chloro, Polychlorinated biphenyls, Trace metals, NTISSOLO

PB-274 464/7ST NTIS Prices: PC A03/MF A01

Polychlorinated Biphenyls in Marine Organisms Off Southern California

Southern California Coastal Water Research Project, El Segundo.

AUTHOR: McDermott, Deirdre J.; Young, David R.; Haesen, Theodore C.
Summary rept. 1971-75
EQ40582 Fld: 6A, 6F, 57H, 47D, 68D GRAI7805
Nov 75 49p
Rept No: SCCWRP-TR223-75
Monitor: 18

Descriptors: *Water pollution, *Chlorine organic compounds, Aquatic animals, Concentration(Composition), California, Tissues(Biology), Ocean environments, Marine biology, Accumulation, Flatfishes, Crabs, Mussels

Identifiers: *Polychlorinated biphenyls, Water pollution detection, Arocolors, Biphenyl/chloro, *Bioaccumulation, *Toxic substances, Fin necrosis, *Marine ecology, NTISSOLO

PB-273 878/9ST NTIS Prices: PC A09/MF A01

Effects of Ocean Dumping Activity, Mid-Atlantic Bight - 1976

Environmental Protection Agency, Philadelphia, Pa. Region III.

AUTHOR: Lear, Donald W.; O'Malley, Morris L.; Smith, Susan K.
Interim rept.
EQ25113 Fld: 13B, 8A, 68D, 47D GRAI7803
Jul 77 186p
Rept No: EPA/903/9-77/029
Monitor: 18

Descriptors: *Sewage sludge, Sampling, Concentration(Composition), Metals, Organic compounds, Carbon, Chlorine organic compounds, Mid-Atlantic Bight, North Atlantic Ocean, Sediments, Trends, Halogen organic compounds, Bacteria, Clams

Identifiers: *Solid waste disposal, *Ocean waste disposal, *Water pollution sampling, Polychlorinated biphenyls, Arctica islandica, Arochlor 1254, Water pollution effects(Animals), NTISEPAL

PB-273 642/6ST NTIS Prices: PC A02/MF A01

Treatment and Stabilization of Polychlorinated Biphenyls (PCBs) Contaminated Water and Waste Oil. A Case Study. Whitehouse, Florida

Environmental Protection Agency, Atlanta, Ga. Region IV.

AUTHOR: Wilkerson, Raymond T.; Stroud, Fred B.; Smith, Al
Technical rept. Jun 76-Jun 77
E05SIF3 Fld: 7D, 68D, 99A GRAI7803
Jul 77 35p
Monitor: 1B

Descriptors: *Water pollution control, *Oil spills, Chlorine organic compounds, Saint Johns River, Activated carbon, Adsorption, Samples, Water analysis, Chemical analysis

Identifiers: *Polychlorinated biphenyls, Water pollution detection, *Oil pits, NTISEPAL

PB-274 115/6ST NTIS Prices: PC A13/MF A01

Environmental Assessment of PCBs in the Atmosphere

MITRE Corp., McLean, Va.;Environmental Protection Agency, Research Triangle Park, N.C. (408 364)

AUTHOR: Fuller, B.; Gordon, J.; Hamreich, H.
Final rept.
E017BK2 Fld: 6T, 4A, 68A*, 57Y* GRAI7802
Apr 76 279p*
Rept No: MTR-7210-REV-1
Contract: EPA-68-02-1405
Monitor: EPA/450/3-77/045

Descriptors: *Air pollution, Chlorine organic compounds, Physical properties, Chemical properties, Monitoring, Sources, Animals, Toxicology, Public health, Atmospheric diffusion, Chemical analysis, Air pollution control, Carcinogens, Ecology, Sampling, Gas analysis

Identifiers: *Polychlorinated biphenyls, Path of pollutants, Air pollution effect(Animals), NTISEPAAMM

PB-272 708/1ST NTIS Prices: PC A03/MF A01

Evaluation of Tests with Early Life Stages of Fish for Predicting Long-Term Toxicity

Environmental Research Lab.-Duluth, Minn.

AUTHOR: McKim, James M.
Journal article
03802K3 Fld: 6F, 6T, 6C, 13B, 57H, 57Y, 98F, 68D GRAI7726
17 Jan 77 10p
Rept No: EPA/600/J-77/046
Monitor: 1B
Pub. in Jnl. of Fisheries Research Board of Canada, v34 n8 p1148-1154 1977.

Descriptors: *Pesticides, *Toxicity, *Fishes, *Water pollution, Life cycles, Metals, Sewage, Biphenyl, Chlorine organic compounds, Survival, Evaluation, Growth, Concentration(Composition), Time, Exposure, Sensitivity, Predictions

Identifiers: Reprints, Biphenyl/chloro, Polychlorinated biphenyls, NTISEPA08D

PB-272 447/4ST NTIS Prices: Not available NTIS

Residues of PCB's and DDT in the Western Lake Superior Ecosystem

Environmental Research Lab.-Duluth, Minn.

AUTHOR: Veith, G. D.; Kuehl, D. W.; Puglisi, F. A.; Glass, G. E.; Eaton, J. G.
Journal article
03734D3 Fld: 6F, 13B, 57H, 68E GRAI7726
1977 14p
Rept No: EPA/600/J-77/045
Monitor: 1B
Pub. in Archives of Environmental Contamination and Toxicology, v5 p67-499 1977.

Descriptors: *Pesticides, *Fishes, *Lake Superior, DDT, Residues, Biphenyls, Chlorine organic compounds, Trout, Concentration(Composition), Size determination, Chlordan, Naphthalene compounds, Benzene, Dieldrin, Chlorohydrocarbons, Halohydrocarbons, Tolerances(Physiology)

Identifiers: Polychlorinated biphenyls, Biphenyl/chloro, Benzene/hexachloro, Hanaclor, NTISEPA08D

PB-271 709/2ST NTIS Prices: PC A02/MF A01

Organic Contaminants

Environmental Research Lab.-Duluth, Minn.

AUTHOR: Glass, G. E.; Strachan, W. M. J.; Willford, W. A.; Armstrong, F. A. J.; Kaiser, K. L. E.
Journal article
D362581 Fld: 13B, 68E, 68D GRAI7724
1977 20p
Rept No: EPA/600/J-77/042
Monitor: 18
Pub. in the Waters of Lake Huron and Lake Superior, v3 p417-902 1977.

Descriptors: *Organic compounds, *Lake Superior, Concentration(Composition), Biphenyls, Water pollution, Toxicity, Biodeterioration, Odors, Tastes, Potable water, Cyanides, Esters, Phthalates, Chlorobenzenes, Chlorine organic compounds, DDT, Insecticides, Dieldrin, Aromatic polynuclear hydrocarbons, Phenols

Identifiers: *Water pollution sampling, Aldrin, Polychlorinated Biphenyls, DDD insecticide, DDE insecticide, Dimethylnaphthalenes, Benzene/hexachloro, Lindane, Cyclohexane/hexachloro, Chlordane, Methanychlor, Norbornene/chloro, Styrene/octachloro, Thiophene/methyl-benzo, Endosulfan, Heptachlor epoxide, Reprints, NTISEPA080

PB-271 017/6ST NTIS Prices: PC A06/MF A01

PCBS Involvement in the Pulp and Paper Industry

Versar, Inc., Springfield, Va.*Environmental Protection Agency, Washington, D.C. Office of Toxic Substances.

AUTHOR: Carr, Roderick A.; Durfee, Robert L.; McKay, Edward G.
Final rept. on Task 4
D36526J1 Fld: 6F, 6T, 13B, 68D, 68, 97 GRAI7723
25 Feb 77 110p
Rept No: 474.5A
Contract: EPA-68-01-3288
Monitor: EPA/560/6-77/006
See also PB-263 012.

Descriptors: *Paper industry, *Environmental impacts, *Chlorine aromatic compounds, Sources, Cost estimates, Water pollution control, Air pollution control, Industrial wastes, Incineration, Carbon, Absorption, Process charting, Pulping, Combustion products, Recirculation, Cost analysis, Mathematical models

Identifiers: *Biphenyl/chloro, Polychlorinated Biphenyls, Path of pollutants, NTISEPA0TS

PB-270 220/7ST NTIS Prices: PC A09/MF A01

A First Order Mass Balance Model for the Sources, Distribution and Fate of PCBs in the Environment

Versar, Inc., Springfield, Va.*Environmental Protection Agency, Washington, D.C. Office of Toxic Substances.

AUTHOR: Whitmore, Frank C.
Final rept.
D329103 Fld: 13B, 68D, 68A GRAI7722
27 Jul 77 180
Rept No: 474-9G
Contract: EPA-68-01-3259
Monitor: EPA/460/6-77/006

Descriptors: *Air pollution, *Water pollution, *Chlorine organic compounds, *Lake Michigan, *Great Lakes, Mathematical models, Distribution(Property), Mass transfer, Sediments, Adsorption, Fallout, Sources, Estimates, Atmospheric models, Evaporation, Concentration(Composition), Input

Identifiers: *Polychlorinated biphenyls, Biphenyl/chloro, *Bioaccumulation, NTISEPA0TS

PB-269 350/5ST NTIS Prices: PC A03/MF A01

Methodology for Measurement of Polychlorinated Biphenyls in Ambient Air and Stationary Sources - A Review

Environmental Monitoring and Support Lab., Research Triangle Park, N.C. Quality Assurance Branch.

AUTHOR: Margeson, John H.
Final rept.
D318464 Fld: 7C, 14B, 68A*, 99A* GRAI7720
Apr 77 39p*
Rept No: EPA/600/4-77/021
Monitor: 18

Descriptors: *Reviews, Chlorine organic compounds, Sampling, Gas analysis, Chemical analysis, Monitoring, Air pollution, Polyurethane resins, Foams, Extraction, Gas chromatography, Electron capture, Absorption, Concentration(Composition), Physical properties, Chemical properties

Identifiers: Stationary sources, *Polychlorinated biphenyls, *Air pollution detection, Aroclors, Electron capture detectors, Biphenyl/chloro, NTISEPA080

PB-267 668/0ST NTIS Prices: Not available NTIS

High Molecular Weight Hydrocarbons in the Air and Sea: Rates and Mechanisms of Air/Sea Transfer

Rhode Island Univ., Kingston. Dept. of Food and Resource Chemistry.•National Science Foundation, Washington, D.C. Office for the International Decade of Ocean Exploration.

AUTHOR: Sidhoum, T. F.; Rice, C. P.; Olney, C. E.
D266374 Fld: 13B, 08E, 06B, 68A GRAI7718
1976 31p
Grant: NSF-GX-33777
Monitor: NSF/IDOE-77-94
Pub. in Marine Pollutant Transfer, Chapter 13, p323-361 1976.

Descriptors: •Hydrocarbons, •Pesticides, •Water pollution, •Air pollution, Chlorine organic compounds, Air water interactions, Concentration(Composition), Troposphere, DDT, Atmospheric diffusion, Sea water

Identifiers: Reprints, Path of pollutants, Polychlorinated biphenyls, International Decade of Ocean Exploration, NTISIODE, NTISNSFG

PB-267 914/0ST NTIS Prices: PC A05/MF A01

The Accumulation and Distribution of Organochlorines and Some Heavy Metals in American Falls Reservoir Fishes, Water, and Sediment

Idaho State Univ., Pocatello. Dept. of Zoology.•Office of Water Research and Technology, Washington, D.C.

AUTHOR: Kent, James C.
Master's thesis
D266244 Fld: 6F, 8H, 06B, 40A, 57H, 57Y, 57Z GRAI7717
1976 87p
Contract: 81-14-34-0001-6013
Project: OWRT-A-043-IDA
Monitor: OWRT-A-043-IDA(1)

Descriptors: •Pesticides, •Water pollution, •Fishes, Fresh water fishes, Insecticides, Chlorine organic compounds, Water analysis, Chemical analysis, DDT, Limnology, Dieldrin, Mercury(Metal), Cadmium, Concentration(Composition), Sediments, Bioassay, Residues, Metals, Arsenic, Particles, Standards, Sampling

Identifiers: Polychlorinated biphenyls, Bioaccumulation, Water runoff, •Heavy metals, DDD insecticides, •Pesticide residues, NTISIDOWRT

PB-266 435/0ST NTIS Prices: PC A03/MF A01

Environmental Applications of Advanced Instrumental Analyses: Assistance Projects FY 75

Environmental Research Lab., Athens, Ga. Analytical Chemistry Branch.

AUTHOR: Alford, Ann L.
D266103 Fld: 13B, 7D, 99A, 68D GRAI7715
Jan 77 48p
Rept No: EPA/600/4-77/004
Project: EPA-16020-GHZ
Monitor: IB
See also report dated Jun 75, PB-247 056.

Descriptors: •Water analysis, Chlorine organic compounds, Absorption spectra, Photometry, Chemical analysis, Organic compounds, Industrial wastes, Trace elements, Fishes, Poultry wastes, Potable water, Atomic spectroscopy, Mass spectrometry, Gas chromatography, Mercury, Sea water, Plants(Botany), Soil analysis, Electric power plants, Neutron activation analysis, Concentration(Composition)

Identifiers: •Water pollution detection, Polychlorinated biphenyls, NTISEPAORD

PB-266 356/0ST NTIS Prices: PC A03/MF A01

Effects of Aroclor (Trademark) 1254 on Brook Trout, 'Salvelinus fontinalis'

Environmental Research Lab.-Duluth, Minn.

AUTHOR: Snarski, Virginia M.; Puglisi, Frank A.
Final rept. 1972-74
D265561 Fld: 6T, 6F, 13B, 98F, 68D, 57Y, 57H GRAI7715
Dec 76 44p
Rept No: EPA/600/3-76/112
Monitor: IB

Descriptors: •Trout, •Chlorine aromatic compounds, •Fishes, Physiological effects, Tables(Data), Growth, Reproduction(Biology), Bioassay, Exposure, Recommendations, Toxicology, Survival, Tissues(Biology), Analyzing, Sampling, Freshwater fishes, Residues, Concentration(Composition)

Identifiers: Biphenyl/chloro, •Aroclor 1254, Bioaccumulation, •Water pollution effects(Animals), •Salvelinus fontinalis, Polychlorinated biphenyls, NTISEPAORD

PB-263 510/0ST NTIS Prices: PC A02

Microbial Metabolism of Polychlorinated Biphenyls. Studies on the Relative Degradability of Polychlorinated Biphenyl Components by 'Alkaligenes' sp

Wisconsin Univ., Madison. Dept. of Entomology.*National Oceanic and Atmospheric Administration, Rockville, Md. Office of Sea Grant. (AD6 667)

AUTHOR: Furukawa, Kenzuke; Matsumura, Fumio
B1Q65363 Fld: 13B, 6A, 57B, 68D, 68H GRAI7708
20 Oct 75 10p
Rept No: WIS-SG-76-369
Monitor: NOAA-76122606
Pub. in Jnl. of Agricultural and Food Chemistry, v24 p251-256 Mar-Apr 76.

Descriptors: *Biodeterioration, Bacteria, Biphenyl, Polyphenyl compounds, Chlorine organic compounds, Degradation, Metabolism, Water pollution, Concentration(Composition), Surface waters, Lakes, Sediments

Identifiers: *Biphenyl/chloro, *Alkaligenes, NTISCOMDA

PB-263 660/1ST NTIS Prices: PC A03/MF A01

PCB Emissions from Stationary Sources: A Theoretical Study

Monsanto Research Corp., Dayton, Ohio. Dayton Lab.*Industrial Environmental Research Lab., Research Triangle Park, N.C. (401 865)

AUTHOR: Knierim, Herman Jr
Final rept.
B1Q65304 Fld: 7A, 68A*, 98B* GRAI7708
Oct 76 43p*
Rept No: MRC-DA-577
Contract: EPA-68-02-1330
Monitor: EPA/600/7-76/036

Descriptors: *Ash content, *Isomers, *Assessments, *Fossil fuels, Electric power plants, Oxidation, Tables(Data), Chlorine organic compounds, Air pollution, Coal, Natural gases, Fuel oil, Furnaces, Reaction kinetics, Aromatic polycyclic hydrocarbons, Thermodynamics, Boilers, Chemical analysis, Combustion products, Industrial wastes, Gas analysis, Concentration(Composition), Sampling, Fly ash

Identifiers: *Biphenyl/chloro, *Air pollution detection, Coal-fired power plants, Stationary sources, Polychlorinated biphenyls, NTISEPA06B

PB-258 162/7ST NTIS Prices: PC A06/MF A01

Destruction of Polychlorinated Biphenyls in Sewage Sludge During Incineration

Versar, Inc., Springfield, Va.*Environmental Protection Agency, Washington, D.C. (389 335)

AUTHOR: Whitmore, Frank C.
Final rept.
D00644KJ Fld: 13B, 68A, 68C GRAI7626
1976 80p
Contract: EPA-68-01-1587
Monitor: 18

Descriptors: *Sludge disposal, *Incinerators, *Air pollution, *Solid waste disposal, Sewage sludge, Chlorine aromatic compounds, Decomposition, Flue gases, Gas sampling, Gas analysis

Identifiers: *Biphenyl/chloro, *Polychlorinated biphenyls, NTISEPA6

PB-256 306/4ST NTIS Prices: PC A13/MF A01

Assessment of Wastewater Management, Treatment Technology, and Associated Costs for Abatement of PCBs Concentrations in Industrial Effluents

Versar, Inc., Springfield, Va.;Environmental Protection Agency, Washington, D.C. Office of Water Planning and Standards. (300 336)

AUTHOR: Durfee, Robert
Final rept. on Task 2
C7006E4 Fld: 7A, 13B, 68D*, 90B* GRAI7619
3 Feb 76 361p*
Contract: EPA-68-01-3200
Monitor: EPA/600/6-76/006
See also PB-256 307.

Descriptors: *Water pollution control, *Industrial waste treatment, Design criteria, Activated carbon, Adsorbents(Materials), Biphenyls, Chlorine organic compounds, Manufacturing, Chemical industry, Capacitors, Transformers, Carbon, Capitalized costs, Operating costs, Cost estimates, Process charting, Effluents, Concentration(Composition), Solid waste disposal, Air pollution, Earth fills, Performance evaluation, Ozonation, Incinerators, Filtration, Oils, Standards, Ultraviolet radiation

Identifiers: *Biphenyl/chloro, *Polychlorinated biphenyls, Amberlite polymers, NTISEPAL, NTISEPAOUP

AD-A026 867/2ST NTIS Prices: PC A02/MF A01

Effect of DDT and Polychlorinated Biphenyls on Cell Population Growth of 'Crithidia Fasciculata', A Flagellated Protozoan

Armed Forces Radiobiology Research Inst Bethesda Md (034700)

AUTHOR: French, J. E.; Roberts, J. F.
Scientific rept.
C7002H1 Fld: 6T, 6F, 13B, 57Y, 68E, 57F GRAI7619
May 76 20p
Rept No: AFRRI-SR76-21
Project: DNA-NWED-QAJM
Task: C900
Monitor: 10

Descriptors: *Cell division, *DDT, *Chlorinated hydrocarbons, *Biphenyl, *Insecticides, Proteins, Toxicity, Metabolism, Concentration(Composition)

Identifiers: Crithidia fasciculata, *Toxicology, Pesticides, NTISDODAA

PB-253 736/5ST NTIS Prices: PC A07/MF A01

Review of PCB Levels in the Environment

Environmental Protection Agency, Dallas, Tex. Region VI.

AUTHOR: Finley, Doris J.; Siff, Frederick H.; DeCarlo, Vincent J.
Final rept.
C6B6413 Fld: 6F, 13B, 57H*, 68*, 68D GRAI7618
Jan 76 143p*
Rept No: EPA/960/7-76-001
Monitor: 10

Descriptors: *Chlorine organic compounds, *Pesticides, *Pollution, Monitoring, Water resources, Sediments, Soils, Fishes, Birds, Lakes, Rivers, Ocean environments, Sewage treatment, Industrial plants, Food, Humans, Concentration(Composition), Solubility, Tables(Data)

Identifiers: *Biphenyl/chloro, Arochlor, *Polychlorinated biphenyls, NTISEPAOTS

PB-251 433/9ST NTIS Prices: PC A13/MF A01

Assessment of Wastewater Management, Treatment Technology, and Associated Costs for Abatement of PCBs Concentrations in Industrial Effluents. Task II

Versar, Inc., Springfield, Va.;Environmental Protection Agency, Washington, D.C. Office of Toxic Substances. (389 339)

AUTHOR: Cantos, Goyanah; Durfree, Robert L.; Hackman, E. E. III; Price, Kenneth
Final rept.
CO4GDM1 Fld: 13B, 07A, 68D, 99E GRAI7612
30 Jun 76 265p
Contract: EPA-68-01-3260
Monitor: EPA/600/6-76/006

Descriptors: *Water pollution control, *Industrial waste treatment, *Sewage treatment, *Chlorine aromatic compounds, Chemical removal(Sewage treatment), Activated carbon treatment, Concentration(Composition), Adsorbents, Solid waste disposal, Incineration, Effluents, Capitalized costs, Operating costs, Capacitors, Ozonization, Ultraviolet radiation, Air pollution control, Cost estimates, Filtration, Chemical removal(Water treatment)

Identifiers: *Biphenyl/chloro, *Polychlorinated biphenyls, NTISEPAOTS

PB-250 786/1ST NTIS Prices: PC A03/MF A01

Statement of Concerns of the Lake Michigan Toxic Substances Committee Related to Polychlorinated Biphenyls

Environmental Protection Agency, Chicago, Ill. Region V.

AUTHOR: Greaser, Karl E.
CO3GDM4 Fld: 13B, 08C, 08H, 68D, 99F GRAI7611
Jun 75 31p
Monitor: 16

Descriptors: *Water pollution, *Fishes, *Toxicity, *Lake Michigan, Meetings, Biphenyl, Chlorine aromatic compounds, Concentration(Composition), Transformers, Indiana, Illinois, Michigan, Wisconsin, Capacitors

Identifiers: Biphenyl/chloro, *Water pollution effects(Animals), Aroclors, Polychlorinated biphenyls, NTISEPA6

PB-224 521/8 NTIS Prices: Not available NTIS

Chlorinated Hydrocarbons in Plankton from the Gulf of Mexico and Northern Caribbean

Texas A and M Univ., College Station. (347 360)

AUTHOR: Giam, C. S.; Wong, M. K.; Hanks, A. R.; Sackett, W. M.; Richardson, R. L.
C198362 Fld: 13B, 8A GRAI7401
1973 8p
Monitor: IDOE-73-42
Pub. in the Bulletin of Environmental Contamination and Toxicology, v9 N5 p376-382 1973.

Descriptors: (*Water pollution, *Mexico Gulf), (*Pesticides, Mexico Gulf), Chlorine organic compounds, Chlorine aromatic compounds, DDT, Plankton, Caribbean Sea, Concentration(Composition), Chlorohydrocarbons, Residues

Identifiers: Baseline measurements, PCB, Biphenyl/chloro, IDOE

PB-214 768/4 NTIS Prices: PC A02/MF A01

Uptake of Toxic Water Pollutants (PCB) by Lake Trout

Northern Michigan Univ., Marquette. Dept. of Biology.

AUTHOR: Parejko, Ronald; Johnston, Raymond
CO4GDM1 Fld: 6F, 57M, 68D, 68E GRAI7307
Jun 73 19p
Contract: 01-14-01-0001-3922
Project: OWRR-A-061-MICH
Monitor: OWRR-A-061-MICH(1)

Descriptors: (*Chlorine organic compounds, *Residues), (*Lake Superior, Water pollution), (*Trout, Residues), (*Water pollution, Chlorine organic compounds), Accumulation, Fresh water fish, Concentration(Composition), DDT, Gas chromatography

Identifiers: *Biphenyl/chloro

```
Set Items Description
  1   305  PCB OR POLYCHLORINATED(W)BIPHEN
  2  3809 LEACH?
  3     1 1AND2
  4 38236 DIFFUS?
  5  1432 DESTRUCTION
  6 31886 CONCENTRATION
  7  5886 ATTENUATION
  8  7217 ABSORPTION
  9 99160  4 OR 5 OR 6 OR 7 OR 8
 10 71480 9AND2
 11    44 1AND10

Print 11/2/1-44

Search Time:  0.883   Prints:  44   Dupes.:  0
```

1104874 ID NO.- EIB11084874
REDUCTION OF POLYCHLORINATED BIPHENYL (PCB) CONCENTRATIONS IN CARP (CYPRINUS CARPIO) FILLETS THROUGH SKIN REMOVAL.
Hare, Marvin F.
Minn Pollut Control Agency, Roseville
Bull Environ Contam Toxicol v 26 n 3 Mar 1981 p 364-366
CODEN: BECTA6
ISSN 0007-4861
DESCRIPTORS: (+ORGANIC COMPOUNDS, +Trace Analysis), MARINE BIOLOGY, ENVIRONMENTAL TESTING.
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 804, 801, 471

1170864 ID NO.- EIB11070864
ULTRASONIC PROPAGATION IN Sloft double quotes IN VIVO Sright double quotes BONE.
Bahari, J.; Singh, S.
Jawaharlal Nehru Univ, New Delhi, India
Ultrasonics v 19 n 2 Mar 1981 p 87-90 CODEN: ULTRA3
ISSN 0041-624X
DESCRIPTORS: (+BIOMEDICAL ENGINEERING, +Ultrasonic Applications).
CARD ALERT: 401, 753

1111003 ID NO.- EIB11011003
CELLULAR TOXICOLOGY DATA ANALYSIS USING A PROGRAMMABLE CALCULATOR.
Garrett, N. E.; Stack, H. Frank
Northrop Serv Inc, Box Triangle Park, NC
Comput Biol Med v 10 n 3 1980 p 153-167 CODEN: CBMDAW
DESCRIPTORS: (+BIOMEDICAL ENGINEERING, +Cytology), (MATHEMATICAL INSTRUMENTS, Pocket Calculators), COMPUTER PROGRAMS, (PLASTICS, Toxicity),
IDENTIFIERS: PROGRAMMABLE CALCULATORS, TOXICOLOGY, POLYCHLOROBIPHENYLS
CARD ALERT: 461, 715, 723, 817

1072026 ID NO.- EIB0072026
OPTIMISATION OF A GAS STRIPPING CONCENTRATION TECHNIQUE FOR TRACE ORGANIC WATER POLLUTANTS.
Colenutt, B. A.; Thorburn, S.
Brunel Univ, Uxbridge, Middx, Engl
Int J Environ Anal Chem v 7 n 3 Jan 1980 p 231-244 CODEN: IJEAA3
ISSN 0306-7319
DESCRIPTORS: +WATER ANALYSIS, WATER POLLUTION.
CARD ALERT: 445, 801, 453

1041549 ID NO.- EIB0041549
FLUX OF AROCLOR 1254 BETWEEN ESTUARINE SEDIMENTS AND WATER.
Willeford, B. J.; Metcalfe, C. D.; Akagi, H. M.; McLeese, D. W.
Fish & Environ Sci, Biol Stn St. Andrews, NB
Bull Environ Contam Toxicol v 24 n 1 Jan 1980 p 20-26
CODEN: BECTA6
ISSN 0007-4861
DESCRIPTORS: (+WATER POLLUTION, +Control), (CHEMICALS, Environmental Impact),
IDENTIFIERS: POLYCHLORINATED BIPHENYLS, PCBS
CARD ALERT: 452, 803, 804, 901

1008329 ID NO.- EIB0028229
ULTRASONIC STUDY OF THE NEMATIC-ISOTROPIC PHASE TRANSITION IN PAA.
Thiriet, Y.; Martinoty, P.
CNRS, Strasbourg, Fr
J Phys (Paris) v 40 n 8 Aug 1979 p 789-797 CODEN: JOPQAG
ISSN 0302-0738
DESCRIPTORS: (+CRYSTALS, LIQUID, +Ultrasonic Effects), (ULTRASONIC WAVES, Absorption),
CARD ALERT: 804, 753

1012945 ID NO.- EIB0012945
ADSORPTION OF WATER-SOLUBLE POLYCHLORINATED BIPHENYL AROCLOR 1242 AND USED CAPACITOR FLUID BY SOIL MATERIALS AND COAL CHARS.
Lee, M. C.; Griffin, R. A.; Miller, M. L.; Chian, E. S. K.
Univ of Ill, Urbana
J Environ Sci Health Part A v A14 n 5 1979 p 419-442
CODEN: JESEDU
DESCRIPTORS: (+INDUSTRIAL WASTES, +Treatment), SOILS, CLAY, ORGANIC COMPOUNDS,
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 452, 483, 804

1008522 ID NO.- EI8001008522
PCB AND OTHER MICROORGANISM INTERACTIONS IN LAKE SUPERIOR SEDIMENTS.
Eisenreich, S. J.; Hollod, G. J.; Johnson, T. C.
Univ of Minn, Minneapolis
Am Chem Soc Div Environ Chem Prepr v 19 n 1 1979: Prepr of Pap presented at the Natl Meet, 177th, Honolulu, Hawaii, Apr 1-6 1979. Publ by Am Chem Soc, Div of Environ Chem, Washington, DC, 1979 p 348-349 CODEN: ACEPCF
DESCRIPTORS: (*WATER POLLUTION, *Control), LAKES, HYDROCARBONS,
IDENTIFIERS: SEDIMENTS
CARD ALERT: 453, 407, 444, 913, 803, 804

1008508 ID NO.- EI8001008502
PRELIMINARY KINETIC MODEL AND SIMULATION OF THE CONCENTRATIONS OF THE SPECIES OF POLYCHLORINATED BIPHENYLS (PCBs) INVOLVED IN PHOTOCHEMICAL AND CHEMICAL TRANSFORMATION IN AQUATIC ENVIRONMENTS.
Kalman, E. V.; Ershaim, A. H.; Zimmerman, G. W.
Univ of Tenn, Knoxville
Proc Annu Tech Meet Inst Environ Sci 25th, Seattle, Wash, Apr 30-May 2 1979. Publ by Inst of Environ Sci, Mt. Prospect, Ill, 1979 p 458-464 CODEN: IESPAF
DESCRIPTORS: *WATER POLLUTION, ORGANIC COMPOUNDS, (CHEMICAL REACTIONS, Reaction Kinetics), MATHEMATICAL MODELS, CHLORINE COMPOUNDS,
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 453, 804

999751 ID NO.- EI7912999751
ANALYSIS OF TOXICITY DATA FOR CALIFORNIA MARINE WATER QUALITY STANDARDS.
Klapow, Lawrence A.; Lewis, Robert H.
Calif State Water Resour Control Board, Sacramento
J Water Pollut Control Fed v 51 n 8 Aug 1979 p 2064-2070
CODEN: JWPFA5
ISSN 0043-1303
DESCRIPTORS: (*WATER ANALYSIS, *Toxicity), (WATER POLLUTION, Water Quality), WASTEWATER, HEAVY METALS, (SEAWATER, Analysis)
CARD ALERT: 445, 801, 914, 453, 931, 471

999699 ID NO.- EI7911999699
ORGANOCHLORINE PESTICIDE AND PCB RESIDUES IN WESTERN GREBES FROM GEAR RIVER MIGRATORY BIRD REFUGE, UTAH.
Lindvall, Mark; Lee, Joseph B.
Utah State Univ, Logan
Bull Environ Contam Toxicol v 23 n 6 Aug 1979 p 754-760
CODEN: BECTA6
ISSN 0007-4861
DESCRIPTORS: (*PESTICIDES, *Environmental Impact), (WATER POLLUTION, Utah),
IDENTIFIERS: ORGANOCHLORINE PESTICIDES, POLYCHLORINATED BIPHENYLS
CARD ALERT: 804, 901, 453

975185 ID NO.- EI7909975185
TRACE ORGANICS REMOVAL BY ADVANCED WASTE TREATMENT
Reinhard, Martin; Dolce, Carla J.; McCarty, Perry L.
Stanford Univ, Calif
ASCE J Environ Eng Div v 105 n 4 Aug 1979 p 675-693
CODEN: JEEGAV
DESCRIPTORS: (*WATER TREATMENT, *Chemicals Removal), ORGANIC COMPOUNDS,
IDENTIFIERS: TRACE ELEMENTS, TRACE ORGANICS REMOVAL
CARD ALERT: 445, 804

975095 ID NO.- EI7909975095
ANALYSIS OF SELECTED TRACE ORGANICS IN ADVANCED WASTEWATER TREATMENT SYSTEMS.
Baird, Rodger; Selna, Michael; Haskins, James; Chappelle, Donald
San Jose Creek Water Qual Lab, Whittier, Calif
Water Res v 13 n 8 1979 p 493-502 CODEN: WATRAG
ISSN 0043-1354
DESCRIPTORS: (*WASTEWATER, *Analysis), ORGANIC COMPOUNDS, WATER ANALYSIS, CHROMATOGRAPHIC ANALYSIS,
IDENTIFIERS: WASTEWATER TREATMENT SYSTEMS
CARD ALERT: 453, 801, 804, 445

964788 ID NO.- EI7906964788
ADSORPTION OF POLYCHLORINATED BIPHENYL ONTO SEA BED SEDIMENT, MARINE PLANKTON, AND OTHER ADSORBING AGENTS.
Hiraizumi, Yasushi; Takahashi, Hideki; Nishimura, Hajime
Univ of Tokyo, Jpn
Environ Sci Technol v 13 n 5 May 1979 p 580-584 CODEN: ESTHAG
ISSN 0013-936X
DESCRIPTORS: *SEDIMENTATION, CHLORINE COMPOUNDS, ADSORPTION, (WATER POLLUTION, Analysis),
CARD ALERT: 931, 804, 801, 802, 453

003120 ID NO.- EI790063120
POLYCHLORINATED BIPHENYL RECOVERY USING ACTIVATED CARBON.
Sunder, P. S.; Lancaster, B. W.; Cleary, J. G.
Westinghouse Elect. Corp, Pittsburgh, Pa
Mid-Year Meet Pap presented at the Natl Meet Min Conf and Exhib, Dist, Denver, Colo, Feb 9-10 1978. Publ by Colo Min Assoc, Denver, 1978 p 139-143 CODEN: MYBBDC
DESCRIPTORS: *POLYCHLORINATED BIPHENYLS, WATER TREATMENT, (CARBON, Activated).
CARD ALERT: 933, 804

003315 ID NO.- EI790063315
ACCUMULATION OF POLYCHLORINATED BIPHENYLS (PCBs) IN SURFICIAL LAKE SUPERIOR SEDIMENTS. ATMOSPHERIC DEPOSITION.
Eisenreich, Steven J.; Hollod, Gregory J.; Johnson, Thomas C.
Univ of Minn, Minneapolis
Environ Sci Technol v 13 n 5 May 1979 p 569-573 CODEN: ESTHAG
ISSN 0013-936X
DESCRIPTORS: (*LAKES, *Sedimentation), ATMOSPHERIC MOVEMENTS, AIR POLLUTION, (WATER POLLUTION, Analysis), SEDIMENTATION, ECOSYSTEMS,
IDENTIFIERS: SEDIMENTS, ATMOSPHERIC TRANSPORT
CARD ALERT: 444, 931, 443, 451, 453, 901

006170 ID NO.- EI790066170
ACCUMULATION OF POLYCHLORINATED BIPHENYL (PHENOCLOR DP6) BY ESTUARINE FISH.
Marbonne, J. F.
Univ de Bordeaux, Talence, Fr
Bull Environ Contam Toxicol v 22 n 1-2 May 1979 p 60-64 CODEN: BECTA6
ISSN 0007-4861
DESCRIPTORS: (*CHEMICALS, *Environmental Impact), (WATER POLLUTION, Control), (ORGANIC COMPOUNDS, Environmental Impact)
IDENTIFIERS: POLYCHLORINATED BIPHENYL, PCB
CARD ALERT: 803, 804, 901, 453

027106 ID NO.- EI790427106
TRANSPLACENTAL MOVEMENT OF ORGANOCHLORINE PESTICIDE RESIDUES IN DESERT BIGHORN SHEEP.
Turner, Jack C.
Univ of Wyo, Laramie
Bull Environ Contam Toxicol v 21 n 1-2 Jan 1979 p 116-124 CODEN: BECTA6
ISSN 0007-4861
DESCRIPTORS: (*PESTICIDES, *Environmental Impact), ORGANOCHLORINE PESTICIDES, POLYCHLORINATED BIPHENYLS, PCBs,
CARD ALERT: 804, 901

013641 ID NO.- EI790213641
DESTRUCTION OF TRACE TOXIC COMPOUNDS IN WATER AND SLUDGE BY IONIZING RADIATION.
Merrill, Edward W.; Mabry, David B.; Schutz, Robert B.; Coleman, Walter D.; Trump, John G.; Wright, Kenneth A.
MIT, Cambridge, Mass
AIChE Symp Ser v 74 n 178 1978. Publ by AIChE, New York, NY, 1978 p 245-250 CODEN: ACSSC0
DESCRIPTORS: *WASTEWATER, WATER TREATMENT, INDUSTRIAL,
IDENTIFIERS: TOXIC COMPOUNDS
CARD ALERT: 445, 453

062300 ID NO.- EI790862300
PRECIPITATION INPUTS OF PCBs TO LAKE MICHIGAN.
Murphy, Thomas J.; Rossmuthe, Charles P.
DePaul Univ, Chicago, Ill
J Great Lakes Res v 3 n 3-4 Dec 1977 p 306-312 CODEN: JGLRDE
DESCRIPTORS: (*WATER POLLUTION, *Analysis), (ORGANIC COMPOUNDS, Environmental Impact), (AIR POLLUTION, Environmental Impact), RAIN AND RAINFALL, LAKES,
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 453, 451, 443, 444

050732 ID NO.- EI780750732
INSECTICIDES, POLYCHLORINATED BIPHENYLS AND METALS IN AFRICAN LAKE ECOSYSTEMS SEN DASHE 3. LAKE NAKURU, KENYA.
Greichus, Yvonne A.; Greichus, Algirdas; Amarnn, Barbara D.; Hopcraft, John
SD State Univ, Brookings
Bull Environ Contam Toxicol v 19 n 4 Apr 1978 p 454-461 CODEN: BECTA6
DESCRIPTORS: (*INSECTICIDES, *Environmental Impact), (WATER POLLUTION, Pesticide Effects), (LAKES, Kenya),
IDENTIFIERS: POLYCHLORINATED BIPHENYLS, PCB
CARD ALERT: 804, 901, 444, 453

708708 ID NO.- EI7710B5708
POLYCHLORINATED BIPHENYLS IN COASTAL MARINE ZOOPLANKTON: BIOACCUMULATION BY EQUILIBRIUM PARTITIONING.
Clayton, John R. Jr; Pavlou, Spyros P.; Breitner, Norman F.
Univ of Wash, Seattle
Environ Sci Technol v 11 n 7 Jul 1977 p 676-682 CODEN: ESTHAG
DESCRIPTORS: (*WATER POLLUTION, *Analysis), (SEAWATER, Analysis).
CARD ALERT: 453, 471, 801

707771 ID NO.- EI7708B7771
ABSORPTION OF PCB'S AND DDT'S ON MEMBRANE FILTERS SEN BASIS A NEW ANALYSES METHOD.
Kurtz, David A.
Pa State Univ, University Park
Bull Environ Contam Toxicol v 17 n 4 Apr 1977 p 391-398 CODEN: BECTAG
DESCRIPTORS: (*INSECTICIDES, *Analysis), (WATER POLLUTION, Pesticide Effects), (WATER ANALYSIS, Toxicity), (HYDROCARBONS, Environmental Impact), FILTERS.
IDENTIFIERS: POLYCHLORINATED BIPHENYLS, PCB
CARD ALERT: 804, 453, 449, 801, 914, 901

749309 ID NO.- EI7708493O9
TRANSPORT PATHWAYS OF POLYCHLORINATED BIPHENYLS IN ATLANTIC WATER.
Harvey, George R.; Steinhauer, William G.
Woods Hole Oceanogr Inst, Mass
J Mar Res v 34 n 4 Nov 1976 p 661-675 CODEN: JMRSAQ
DESCRIPTORS: (*WATER POLLUTION, *Analysis), CHLORINE COMPOUNDS, HYDROCARBONS, ORGANIC CHEMICALS.
CARD ALERT: 453, 804, 803

720312 ID NO.- EI7708B9212
TRANSPORT OF HEAVY CHLORINATED HYDROCARBONS IN THE ATMOSPHERE.
Risebrough, Vance E.
NOAA, La Jolla, Calif
Environ Sci Technol v 10 n 13 Dec 1976 p 1223-1228 CODEN: ESTHAG
DESCRIPTORS: (*AIR POLLUTION, *Analysis), HYDROCARBONS, AEROSOLS, SOIL POLLUTION, CHLORINE COMPOUNDS.
CARD ALERT: 451, 801, 804, 483, 901

708907 ID NO.- EI7708B8907
ADSORPTION OF POLYCHLORINATED BIPHENYLS FROM AQUEOUS SOLUTIONS AND SEWAGE.
Lawrence, John; Tosine, Haile M.
Can Cent for Inland Waters, Burlington, Ont.
Environ Sci Technol v 10 n 4 Apr 1976 p 381-383 CODEN: ESTHAG
DESCRIPTORS: *WATER POLLUTION, (HYDROCARBONS, Adsorption).
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 453, 804

681338 ID NO.- EI7612B1338
STUDIES ON THE ADSORPTION OF SELECTED POLYCHLORINATED BIPHENYL ISOMERS ON SEVERAL SURFACES.
Haque, R.; Schmedding, D.
Oreg State Univ, Corvallis
J Environ Sci Health Part B v B11 n 2 1976 p 129-137 CODEN: JPFCD2
DESCRIPTORS: (*HYDROCARBONS, *Adsorption), SOIL POLLUTION.
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 803, 804, 802, 483

678508 ID NO.- EI7611785O8
RISING CLAMOR ABOUT PCB'S.
Anon
Environ Sci Technol v 10 n 2 Feb 1976 p 122-123 CODEN: ESTHAG
DESCRIPTORS: *WATER POLLUTION, (HYDROCARBONS, Toxicity), CHLORINE COMPOUNDS, LEGISLATION.
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 453, 803, 804, 902

645859 ID NO.- EI7607458S9
ORGANOCHLORINE COMPOUNDS IN NEOPLASTIC AND ADJACENT APPARENTLY NORMAL BREAST TISSUE.
Wassermann, M.; Nogueira, D. P.; Tomatis, L.; Mirra, A. P.; Shibata, M.; Arie, G.; Cucos, Sinitica; Wassermann, Dora
Heb Univ, Hadassah Med Sch, Jerusalem, Isr
Bull Environ Contam Toxicol v 15 n 4 Apr 1976 p 478-484 CODEN: BECTAG
DESCRIPTORS: (*INSECTICIDES, *Toxicity), (BIOMEDICAL ENGINEERING, Living Systems Studies).
CARD ALERT: 804, 461

039886 ID NO.- EI7508033886
ADSORPTION OF KRYPTON FROM HELIUM BY LOW TEMPERATURE CHARCOAL.
Cooper, R. N.; Stevens, C. R.; Taylor, G. R.
Westinghouse Electr Corp, Madison, Pa
AEC Air Clean Conf, 13th, Proc, Pap and Discuss, San Francisco, Calif, Aug 12-15 1974 v 1 p 151-168. Publ by AEC (Conf-740807), San Francisco, Calif, 1975. Available from Natl Tech Inf Serv, Springfield, Va
DESCRIPTORS: (+NUCLEAR REACTORS, +Fast Reactors), (KRYPTON, Adsorption), CHARCOAL.
CARD ALERT: 631, 804, 934

039884 ID NO.- EI7508039884
MULTIDIMENSIONAL APPLICATIONS OF AN INTEGRAL BALANCE TECHNIQUE FOR NEUTRON DEPRESSION COMPUTATIONS.
Burns, T. J.; Corning, J. J.
Univ of Ill, Urbana-Champaign
Comput Methods in Nucl Eng, Conf, Proc, Charleston, SC, Apr 15-17 1975 v 2 Sess V-B p 57-67. Publ by Dupont, Aiken, SC, 1975. Available from Natl Tech Inf Serv (CONF-750413), Springfield, Va.
DESCRIPTORS: +NEUTRONS, (MATHEMATICAL TECHNIQUES, Finite Element Method).
IDENTIFIERS: INTEGRAL BALANCE METHOD, PARTIAL CURRENT BALANCE (PCB) METHOD
CARD ALERT: 932, 921

080140 ID NO.- EI7512080140
INTERNATIONAL CONFERENCE ON TRANSPORT OF PERSISTENT CHEMICALS IN AQUATIC ECOSYSTEMS, PROCEEDINGS, 1974.
Conf
Int Conf on Transp of Persistent Chem in Aquat Ecosyst, Proc, Pap, and Abstr, Ottawa, Ont, May 1-3 1974 Publ by Natl Res Counc of Can, Ottawa, Ont, 1974
DESCRIPTORS: +ECOLOGY, (WATER POLLUTION, Control), (RIVERS, Estuaries), (GEOCHEMISTRY, Trace Elements), MERCURY AND AMALGAMS, (WATER ANALYSIS, Toxicity)
CARD ALERT: 901, 483, 407, 444, 481, 549

563002 ID NO.- EI7510063002
PARA-DICHLOROBENZENE IN HUMAN TISSUE AND ATMOSPHERE IN TOKYO METROPOLITAN AREA.
Morita, M.; Ohi, G.
Tokyo Metrop Res Lab of Pub Health, Shinjuku-Ku, Jpn
Environ Pollut v 8 n 4 Jun 1975 p 309-314 CODEN: ENVPAF
DESCRIPTORS: (+AIR POLLUTION, +Tokyo), (CHEMICALS, Toxicity)
ENVIRONMENTAL ENGINEERING.
CARD ALERT: 454, 803, 901

526803 ID NO.- EI7504526803
MIGRATION OF POLYCHLORINATED BIPHENYLS IN SOIL INDUCED BY PERCOLATING WATER.
Tucker, E. S.; Litschgi, W. J.; Moss, W. R.
Monsanto Co, St. Louis, Mo
Bull Environ Contam Toxicol v 13 n 1 Jan 1975 p 86-93
CODEN: BECTA6
DESCRIPTORS: (+PLASTICS, +Toxicity), (SOILS, Testing).
CARD ALERT: 817

513039 ID NO.- EI7502513039
OCCURRENCE OF DDT AND PCB COMPOUNDS IN BALTIC HERRING AND PIKE FROM THE TURKU ARCHIPELAGO.
Linko, R. R.; Kattarainta, J.; Rantamaki, P.; Eronen, L.
Univ of Turku, Finl
Environ Pollut v 7 n 3 Nov 1974 p 193-207 CODEN: ENVPAF
DESCRIPTORS: (+WATER ANALYSIS, +Toxicity), INSECTICIDES.
IDENTIFIERS: DDT, PCB
CARD ALERT: 445, 801, 804

464122 ID NO.- EI7410064122
OBSERVATIONS ON THE DISTRIBUTION OF CHLORINATED HYDROCARBONS IN ATLANTIC OCEAN ORGANISMS.
Harvey, George R.; Mihias, Helen P.; Bowen, Vaughn T.; Steinhauer, William G.
Woods Hole Oceanogr Inst, Mass
J Mar Res v 32 n 2 1974 p 103-118 CODEN: JMRSAO
DESCRIPTORS: +OCEANOGRAPHY, FISHERIES, CHEMICALS, PESTICIDES
IDENTIFIERS: CHLORINATED HYDROCARBONS
CARD ALERT: 471, 804, 803, 513

459978 ID NO.- EI7410059978
ATMOSPHERIC TRANSPORT OF POLYCHLOROBIPHENYLS TO THE NORTH ATLANTIC.
Harvey, George R.; Steinhauer, William G.
Woods Hole Oceanogr Inst, Mass
Atmos Environ v 8 n 8 Aug 1974 p 777-782 CODEN: ATENBP
DESCRIPTORS: (+AIR POLLUTION, +Analysis), ATMOSPHERIC MOVEMENTS, HYDROCARBONS.
CARD ALERT: 443, 461, 804

[illegible] ID NO.- EI7404220000
BESTIMMUNG VON POLYCHLORBIPHENYLEN IN WASSER MIT HILFE DER PERCHLORIERUNG ZU DECACHLORBIPHENYL. Stieft Brachetz
Determination of Polychlorinated Biphenyls in Water by Using Exhaustive Chlorination to Decachlorobiphenyl Stieft Brachetz
Bauer, U.
Inst Fuer Wasserforsch, Dortmund, Ger
Vom Wasser v 41 1973 p 99-114 CODEN: VOWAAU
DESCRIPTORS: (+WATER TREATMENT, +Chlorination), CHLORINE COMPOUNDS, WATER ANALYSIS, PHENOLS.
IDENTIFIERS: BIPHENYLS
CARD ALERT: 449, 804

297408 ID NO.- EI7213194B0
TOXICITY AND PHYSIOLOGICAL ACTIVITY OF AROCLOR++R 1254 TO SEVERAL ESTUARINE ORGANISMS.
Nimmo, D. R.; Hanson, B. J.; Couch, J. A.; Cooley, N. R.; Parrish, P. R.
Assoc Lab of the National Environmental Res Center, Corvallis, Oreg
An Chem Soc, Div Water, Air and Waste Chem. Prepr v 12 n 2 Pap for Meet Aug 30-Sep 1 1972 p 188-196 CODEN: ACWCAU
DESCRIPTORS: (+BIOMEDICAL ENGINEERING, +Living Systems Studies), PESTICIDES, PHENOLS.
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 461, 804

297408 ID NO.- EI7213194T0
COMPUTER ASSISTED GC-MS EXAMINATION OF FISH EXTRACTS FOR PCB AND PESTICIDE RESIDUES IN SILICIC ACID COLUMN FRACTIONS.
Stalling, David L.
Fish-Pesticide Res Lab, Columbia, Mo
An Chem Soc, Div Water, Air and Waste Chem. Prepr v 12 n 2 Pap for Meet Aug 30-Sep 1 1972 p 72 CODEN: ACWCAU
DESCRIPTORS: (+CHEMICAL ANALYSIS, +Spectrographic), PESTICIDES, (WATER POLLUTION, Control), SPECTROSCOPIC ANALYSIS PHENOLS.
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 453, 801, 804

297462 ID NO.- EI7213194G4
INSECTICIDES, POLYCHLORINATED BIPHENYLS AND MERCURY IN WILD CORMORANTS, PELICANS, THEIR EGGS, FOOD AND ENVIRONMENT.
Greichus, Yvonne A.; Greichus, Algirdas; Emerich, Royce
South Dakota State Univ, Brookings
An Chem Soc, Div Water, Air and Waste Chem. Prepr v 12 n 2 Pap for Meet Aug 30-Sep 1 1972 p 51-58 CODEN: ACWCAU
DESCRIPTORS: +INSECTICIDES, (WATER POLLUTION, Control), (CHEMICAL ANALYSIS, Chromatographic), CHROMATOGRAPHIC ANALYSIS, PHENOLS, INSECTICIDES,
IDENTIFIERS: POLYCHLORINATED BIPHENYLS
CARD ALERT: 453, 801, 804

297461 ID NO.- EI7213194G3
POLYCHLORINATED BIPHENYL (PCB) IDENTIFICATION IN MARINE ARCTIC AND SUBARCTIC FOOD CHAINS.
Bowes, Gerald W.; Jonkel, Charles J.
Canadian Wildlife Service, Ottawa, Ont
An Chem Soc, Div Water, Air and Waste Chem. Prepr v 12 n 2 Pap for Meet Aug 30-Sep 1 1972 p 50 CODEN: ACWCAU
DESCRIPTORS: (+WATER POLLUTION, +Control), (CHEMICAL ANALYSIS, Chromatographic), CHROMATOGRAPHIC ANALYSIS, INSECTICIDES, PHENOLS.
IDENTIFIERS: FOOD CHAINS, POLYCHLORINATED BIPHENYLS
CARD ALERT: 453, 801, 804

296707 ID NO.- EI7213187B0
DDT AND PCB IN SOUTH SWEDISH STREAMS.
Sodergren, A.; Svensson, B.; Ulfstrand, S.
Department of Animal Ecology, Lund, Swed
Environ Pollut v 3 n 1 Jan 1972 p 25-36 CODEN: ENVPAF
DESCRIPTORS: +WATER POLLUTION, INSECTICIDES, INDUSTRIAL POISONS,
CARD ALERT: 453, 803, 914

296719 ID NO.- EI7213187J1
POLYCHLORINATED BIPHENYLS: EFFECT OF LONG-TERM EXPOSURE ON ATPase ACTIVITY IN FISH, PINNIPHALES PRONELAS.
Koch, R. B.; Desaiah, D.; Yap, H. H.; Cutkomp, L. K.
Honeywell Res Cent, Hopkins, Minn
Bull Environ Contam Toxicol v 7 n 2-3 Feb-Mar 1972 p 87-92 CODEN: BECTAG
DESCRIPTORS: +WATER POLLUTION, INDUSTRIAL POISONS,
IDENTIFIERS: POLYCHLOROBIPHENYLS
CARD ALERT: 453, 914

```
Set Items Description
  1    666  PCB OR POLYCHLORINATED(W)BIPHEN
  2    328 LEACH?
  3      0 1AND2
  4 10610 DIFFUS?
  5    828 DESTRUCTION
  6 10648 CONCENTRATION
  7   4370 ATTENUATION
  8   3466 ADSORPTION
  9 41712  4 OR 5 OR 6 OR 7 OR 8
 10 41986 OOR2
 11      0 1AND10

Print 11/3/1-8

Search Time:  0.062   Prints:   0   Docs.:   0
```

002300 A81079149
GEOCHEMICAL DISTRIBUTION OF TRACE METALS AND ORGANOCHLORINE CONTAMINANTS OF A LAKE ONTARIO SHORELINE MARSH
GLOOSCHENKO, W.A.; CAPOBIANCO, J.; COSBURN, J.; GLOOSCHENKO, V.
AQUATIC ECOLOGY DIV., NAT. WATER RES. INST., BURLINGTON, ONTARIO, CANADA;
WATER, AIR AND SOIL POLLUT. (NETHERLANDS) VOL.15, NO.2 197-213 FEB. 1981 Coden: WAPLAC
Treatment: EXPERIMENTAL
Document Type: JOURNAL PAPER
(32 Refs)
Descriptors: POLLUTION; GEOCHEMISTRY; SEDIMENTS; LAKES; ORGANIC COMPOUNDS
Identifiers: ORGANOCHLORINE CONTAMINANTS; LAKE ONTARIO SHORELINE MARSH; WATER QUALITY STUDY; BATTRAY MARSH; SUBURBAN MARSH; MISSISSAUGA; ONTARIO; SEDIMENTARY GEOCHEMISTRY STUDY; CU; ZN; PB; NB; LOCAL SOILS; LAKE ONTARIO RECENT SEDIMENTS; CO ; CR; NI; CD; SILTS; CLAYS; SUSPENDED SEDIMENT SAMPLE; SHERIDAN CREEK; P,P/SUP 1/-DDE; P,P/SUP 1/-DDD; P,P/SUP 1/-DDT ; ALPHA-CHLORDANE; PCB; MIREX; HCB; SEDIMENTS POLLUTION; WATER POLLUTION; CANADA; TRACE METALS GEOCHEMICAL DISTRIBUTION; AD 1975 OR TO 12; GEOCHEMICAL DATA FACTOR ANALYSIS; AD 1950 TO 1978; SEDIMENT DEPOSITION RATES; ORGANIC C CONCENTRATIONS
Class Codes: A8670C; A8670E; A9240N; A9240S; A9330N; A92400

003800 A81099834, B81034616
ULTRASOUND PROPAGATION IN VIN VIVOP BONE
BEHARI, J.; SINGH, S.
SCHOOL OF ENVIRONMENTAL SCI., JAWAHARLAL NEHRU UNIV., NEW DELHI, INDIA
ULTRASONICS (GB) VOL.19, NO.2 87-90 MARCH 1981 Coden: ULTRA3
Treatment: EXPERIMENTAL
Document Type: JOURNAL PAPER
(40 Refs)
Descriptors: BIOMEDICAL ULTRASONICS; ULTRASONIC PROPAGATION; BONE
Identifiers: IN VIVOP BONE; COUPLED TRANSDUCER; LEAD ZIRCONATE TITANATE; PCB-6; STAINLESS STEEL ELECTRODES; ULTRASOUND VELOCITY; ATTENUATION CONSTANT; REFLECTED POWER; BIOMEDICAL ULTRASONICS
Class Codes: A4380; A8760B; B7810B; B7830

006101 C80003438
CELLULAR TOXICOLOGY DATA ANALYSIS USING A PROGRAMMABLE CALCULATOR
GARRETT, N.E.; STACK, H.F.
HEALTH EFFECTS RESEARCH PROGRAM, NORTHROP SERVICES INC., RES. TRIANGLE PARK, NC, USA
COMPUT. BIOL. AND MED. (GB) VOL.10, NO.3 193-67 1980 Coden: CBMDAW
Treatment: APPLIC; THEORETICAL
Document Type: JOURNAL PAPER
(15 Refs)
Descriptors: MEDICAL COMPUTING; COMPLETE COMPUTER PROGRAMS
Identifiers: DATA ANALYSIS; PROGRAMMABLE CALCULATOR; ENVIRONMENTAL POLLUTANTS; CELLULAR TOXICOLOGY
Class Codes: C7330

434320 A80076487, B80042858
REMEDIING PCB WASTES. PLASMA ARC PYROLYSIS SHOWS PROMISE FOR SAFE DISPOSAL
BARTON, T.G.; ARSENAULT, R.P.; DOBSON, R.L.; MORDY, J.G.
CIVIL ENGNG. DEPT., ROYAL MILITARY COLL., KINGSTON, CANADA
ENG. J. (CANADA) VOL.63, NO.1 40-2 FEB. 1980 Coden: ENJOAK
Treatment: APPLIC; EXPERIMENTAL
Document Type: JOURNAL PAPER
(4 Refs)
Descriptors: WASTE DISPOSAL; ORGANIC COMPOUNDS; PYROLYSIS; PLASMA DEVICES
Identifiers: POLYCHLORINATED BIPHENYLS; PLASMA ARC PYROLYSIS ; PCB WASTES DISPOSAL
Class Codes: A8230L; A8275M; B8350; B0160

416709 B80034479
BUSBAR CONNECTIONS (COMMON BUS). THE SUPPRESSION OF NOISE IN FEEDER CONNECTIONS (LOGIC PCB CONNECTIONS)
RAMAN, D.; DE LA LLOSA, R.D.
UNIV. AUTONOMA DE MADRID, MADRID, SPAIN
MUNDO ELECTRON. (SPAIN) NO.95 115-22 APRIL 1980 Coden: MUELCN
Treatment: PRACTICAL APPLIC; EXPERIMENTAL
Document Type: JOURNAL PAPER
Languages: SPANISH
Descriptors: BUSBARS; PRINTED CIRCUITS
Identifiers: FEEDER CONNECTIONS; TRANSMISSION LINE; COMMON BUS CONDUCTORS; PARASITIC NOISES; TOTAL ATTENUATION; BUSBARS; LOGIC PCB INTERCONNECTION
Class Codes: B2210B

209847 A79009761
ULTRASONIC STUDY OF THE NEMATIC-ISOTROPIC PHASE TRANSITION IN PAA
THERIET, Y.; MARTINOTY, P.
LAB. BIOACOUSTIQUE MOLECULAIRE, UNIV. LOUIS-PASTEUR, STRASBOURG, FRANCE
J. PHYS. (FRANCE) VOL.40, NO.8 709-17 AUG. 1979
Codon: JPHQAG
Treatment: EXPERIMENTAL
Document Type: JOURNAL PAPER
(26 Refs)
Descriptors: ORGANIC COMPOUNDS; LIQUID CRYSTAL PHASE TRANSFORMATIONS; ULTRASONIC VELOCITY; ULTRASONIC ABSORPTION; NEMATIC LIQUID CRYSTALS
Identifiers: PAA; P-AZOXYANISOLE; NEMATIC ISOTROPIC PHASE TRANSITION; US VELOCITY; US ABSORPTION
Class Codes: A6470E; A6390; A6120E

159539 B79020427
AN ALL-BAND UHF TVI FILTER
RICHARDSON, D.F.
RADIO COMMUN. (GB) VOL.54, NO.7 504-5 JULY 1978
Codon: RADCB7
Treatment: PRACTICAL APPLIC
Document Type: JOURNAL PAPER
Descriptors: HIGH-PASS FILTERS; TELEVISION RECEIVERS
Identifiers: UHF TV RECEIVERS; TELEVISION INTERFERENCE FILTER; HIGH PASS FILTER
Class Codes: B1270; B6430D

118024 B78042110
SPECIAL CONNECTORS FOR 19 INCH SLIDE SUBRACKS
NOWACKI, H.
HARTING COMPANY, ESPELKAMP, GERMANY
ELEKTRONIK (GERMANY) VOL.27, NO.7 58-63, 92 JULY 1978
Codon: ENMAAR
Treatment: GENERAL,REVIEW; EXPERIMENTAL
Document Type: JOURNAL PAPER
Language: GERMAN (12 Refs)
Descriptors: ELECTRIC CONNECTORS
Identifiers: 19 INCH SLIDE SUBRACKS; SUBRACK SYSTEMS; EUROCARDS; BATH SOLDERING; SPRING CONTACT STRIPS; CRIMPED WIRE CONNECTIONS; ELECTRICAL CONNECTORS; PCB PLUGGING; WIRE WRAPPED CONNECTIONS; PLUGIN CONNECTION SIGNAL ATTENUATION
Class Codes: B2180E

```
Set  Items  Description
  1    440  PCB OR POLYCHLORINATED(V)BIPHEN
  2    681  LEACHT
  3      0  1AND2
  4   9830  DIFFUS?
  5    834  DESTRUCTION
  6   7430  CONCENTRATION
  7   1293  ATTENUATION
  8   4302  ADSORPTION
  9  23196  4 OR 5 OR 6 OR 7 OR 8
 10  23064  9AR2
 11      3  1AND10

Print 11/3/1-3

Search Time:  0.030   Prints:   3   Recds.:   9
```

1939488 ARTICLE DATA ORDER#: LC789 6 REFS
RELATIONSHIP BETWEEN THE CONSUMPTION OF TOXIC RICE OIL AND THE LONG-TERM CONCENTRATION OF POLYCHLORINATED BIPHENYLS IN THE BLOOD OF YOUSHO PATIENTS (ENGLISH)
HAYABUCHI H; IKEDA M; YOSHIMURA T; MASUDA Y
FOOD AND COSMETICS TOXICOLOGY . V19, N1, P53-58, 1981
KYUSHU UNIV,FAC MED,DEPT PUBL HLTH,HIGASHI KU/FUKUOKA 812//JAPAN/; UNIV OCCUPAT & ENVIRONM HLTH,SCH MED,DEPT HUMAN ECOL/KITAKYUSHU GOT//JAPAN/; DAIICHI COLL PHARMACEUT SCI,MINAMI KU/FUKUOKA 815//JAPAN/

1711007 ARTICLE DATA ORDER#: KT361 14 REFS
THE CHEMICAL DESTRUCTION OF POLYCHLORINATED BIPHENYLS BY SODIUM NAPHTHALENIDE (ENGLISH)
SMITH JR; BUDDAR GL
JOURNAL OF CHEMICAL TECHNOLOGY AND BIOTECHNOLOGY . V30, N11, P630-636, 1980
UNIV WATERLOO,GUELPH WATERLOO CTR GRAD WORK CHEM,DEPT CHEM/WATERLOO NOL 3G1/ONTARIO/CANADA/

0332344 ARTICLE DATA ORDER#: FM640 0 REFS
THERMAL DESTRUCTION OF PCB AND HEXACHLOROBENZENE (ENGLISH)
AHLING B; LINDSTROM A
SCIENCE OF THE TOTAL ENVIRONMENT . V10, N1, P51-58, 1978
SWEDISH WATER & AIR POLLUT RES INST,BOX 21060/S-10031 STOCKHOLM//SWEDEN/

```
Set  Items  Description
  1      5  PCB OR POLYCHLORINATED(W)BIPHEN
  2      4  LEACH?
  3      0  1AND2
  4     65  DIFFUS?
  5      4  DESTRUCTION
  6     29  CONCENTRATION
  7      7  ATTENUATION
  8     10  ADSORPTION
  9    134  4 OR 5 OR 6 OR 7 OR 8
 10    130  9NOT2
 11      0  1AND10

Print 1/2/1-5

Search Time:  0.041   Prints:   5   Docus.:   9
```

083234 05484
STD. REQUIREMENTS FOR FIXED PAPER AND FILM PAPER DIELECTRIC CAPACITORS WITH NON PCB IMPREGNANTS FOR ALTERNATING CURRENT APPLICATIONS
EIA (ELECTRONIC INDUSTRIES ASS'N)
1978
ENGLISH
APPROVED - ANSI
Identifiers: For use with Motors, High Intensity Discharge (HID) Lighting Ballasts, Ferroresonant Transformer Power Supplies, Motors

082178 05309-1
STD. FOR FIXED PAPER DIELECTRIC CAPACITORS WITH NON PCB IMPREGNANT FOR ALTERNATING CURRENT APPLICATIONS
EIA (ELECTRONIC INDUSTRIES ASS'N)
1977
ENGLISH
APPROVED - ANSI

087006 02634
TENT. TEST METH. FOR POLYCHLORINATED BIPHENYLS (PCB'S) IN WATER
ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
MISC (MISCELLANEOUS)
1978
ENGLISH

087350 02304 NSA CARD NO: 12
STD. METHOD FOR ANALYSIS OF ENVIRONMENTAL MATERIALS FOR POLYCHLORINATED BIPHENYLS
ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
MISC (MISCELLANEOUS)
1977
ENGLISH
APPROVED - ANSI

088078 MIL-C-83503/30 NSA CARD NO: 09
CONNECTOR, HEADER, RIGHT ANGLE (.100 INCH SPACING) WITH POLARIZING FEATURE (WRAPPOST OR PCB TERMINATION)
DOD (DEPARTMENT OF DEFENSE)
5935 (CONNECTORS, ELECTRICAL)
1988 MAR 13
ENGLISH

Feasibility Study of Chemical Detoxification of Polychlorinated Biphenyl Capacitors
Phase I Study

EPRI

EPRI CS-2477
Project 1263-7
Final Report
June 1982

Keywords:
Polychlorinated Biphenyls
Capacitors
Dechlorination
Waste Disposal

Prepared by
Acurex Waste Technologies, Inc.
Mountain View, California

ELECTRIC POWER RESEARCH INSTITUTE

Feasibility Study of Chemical Detoxification of Polychlorinated Biphenyl Capacitors

Phase I Study

CS-2477
Research Project 1263-7

Final Report, June 1982

Prepared by

ACUREX WASTE TECHNOLOGIES, INC.
485 Clyde Avenue
Mountain View, California 94042

Principal Investigators
G. J. Mille
L. Weitzman

Prepared for

Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, California 94304

EPRI Project Manager
R. Komai

Heat, Waste, and Water Management Program
Coal Combustion Systems Division

ABSTRACT

Chemical detoxification of polychlorinated biphenyl (PCB) using sodium metal reduction is emerging as a significant new method of destroying PCB liquids. This report presents the results of a preliminary study on chemical detoxification as it applys to PCB's in capacitors. The results of the first phase of a two-phase study are presented to evaluate the possibility of chemical processing of PCB capacitors. The tasks are broken down within each phase as follows:

Phase I

- Literature search
- Acquisition of EPA permits for PCB research
- Evaluation of the legal and regulatory requirements of this process
- Design specialized equipment for handling PCB capacitors in the laboratory
- Design Phase II research program

Phase II

- Construct laboratory housings
- Develop safe methods for opening PCB capacitors during processing
- Develop method for safe disposal or decontamination of capacitor shell
- Develop method for destruction of PCB's in capacitor core
- Determine cost of this treatment and design a demonstration program

The results of the first-phase program were very encouraging. Based on available information, it appears possible to chemically destroy PCB's in capacitors. This report identifies questions that must be answered by the Phase II (laboratory) program before the feasibility of such an operation can be determined. Finally, this report describes a research program that must be followed to answer the previously mentioned questions, and to develop the design data for a full-scale capacitor treatment system.

EPRI PERSPECTIVE

PROJECT DESCRIPTION

The electric utility industry is faced with the task of removing and disposing of polychlorinated biphenyl (PCB) capacitors. Removal can be achieved either by removing failed capacitors or by utilizing some form of accelerated phase-out. The only disposal options at this writing are storage by the utility or destruction at the sole incinerator certified for capacitors, the ENSCO facility in El Dorado, Arkansas. This project pursues chemical destruction of capacitor PCBs to provide another option for the industry's 2.8 million capacitors.

This final report summarizes the results of Phase I of a two-phase study (RP1263-7) to examine the feasibility of a chemical disposal option for PCB equipment. Previously published reports on PCBs (EPRI Final Reports FP-1207, Volumes 1 through 4) delineate the scope of the problem and of potential disposal options (Volume 1), provide guidance for the development of spill plans (Volumes 2 and 3), and document EPRI participation in the sampling and analysis during the ENSCO incinerator test burn (Volume 4).

PROJECT OBJECTIVES

The overall objectives of the study are to further develop existing technology for treating dilute PCBs in mineral oil and to extend the technology to the treatment of high-concentration PCBs in capacitors. The first-phase objective, reported here, was to investigate and determine the legal and regulatory requirements for the second-phase experimental work and the eventual commercial process.

PROJECT RESULTS

The proposed process for treatment of PCB capacitors is based upon sodium chemistry, i.e., a reactive organo-sodium compound dechlorinates the PCBs. Phase I of this study investigated the literature for information on capacitor handling and treatment of PCBs; identified, applied for, and received the permits required to pursue PCB-destruction research; solicited guidelines on the degree of PCB destruction

required of the treatment process; and developed the test plan to be pursued in Phase II.

Phase I results support the continuation of the project into Phase II. The chemical treatment process will be deemed acceptable if no detectable PCB is found in the chemically treated waste. The method of analysis to be used is gas chromatography with an electron capture detector, and the EPA considers the limit of detection to be in the 1 to 2 ppm range. The primary approach of Phase II will be to test whether it is possible to destroy the PCBs in the capacitor without first leaching them out of the cellulose matrix.

This report is intended to provide a summary of this planned chemical treatment option to utility personnel involved with PCB capacitor disposal. The report also provides a description and explanation of the federal requirements for alternatives to incineration; the explanation may prove useful in the evaluation of other PCB-destruction technologies.

Phase II is already under way. The scheduled completion of the project is the end of 1982.

Ralph Y. Komai, Project Manager
Coal Combustion Systems Division

ACKNOWLEDGMENTS

The author gratefully acknowledges the help provided him by Mr. Earl Story and members of his staff at the Cincinnati Gas and Electric Company. The information they provided on the structure and methods of handling of capacitors proved invaluable to the design of the equipment and procedures for the Phase I and II study.

CONTENTS

SUMMARY

The disposal of capacitors containing polychlorinated biphenyl (PCB) dielectric fluid is a major problem for the electric utility industry. With the start of operation of the Energy Systems Corporation (ENSCO) incinerator in El Dorado, Arkansas, the Environmental Protection Agency (EPA) ruled that sufficient capacity for PCB disposal was available and PCB capacitor landfilling would no longer be allowed. The utility industry has been skeptical that only one facility can handle all of the waste capacitors produced, hence alternative technologies must be evaluated and developed.

Recently chemical detoxification of PCB using sodium metal reduction has emerged as a significant method of treating liquid PCB. This approach has the advantage of mobility. It can be taken to the PCB's so that siting problems are eliminated and transport cost reduced. The process results in very low emissions, effluents and waste production. Furthermore, the costs of this treatment is usually less than incineration.

This report presents the results of a preliminary study showing that this type of treatment may be applicable to PCB capacitors as well. It presents the results of the first of a two-phase study to evaluate the feasibility of chemical processing of PCB capacitors. The tasks in each of the two phases are:

Phase I

1. Literature search
2. Acquisition of EPA permits for PCB research
3. Evaluation of legal and regulatory requirements of such a process
4. Design of specialized equipment for handling PCB capacitors in the laboratory
5. Based on the results of 1 and 3 above design the Phase II research program

Phase II

1. Construct laboratory housings for handling capacitors
2. Develop safe methods for opening PCB capacitors during processing
3. Develop method for safe disposal or decontamination of capacitor shell
4. Develop method(s) for the destruction of the PCB's in the capacitor core
5. Determine the cost of such a treatment and design a demonstration program

The results of this first-phase program were very encouraging. They showed that there appears to be no theoretical reason why PCB's in capacitors cannot be destroyed by chemical means. A program was developed to obtain the cost of data needed in order to design and determine the cost of the process.

The preliminary program identified the following potential problems associated with the chemical processing of capacitors:

- Gas buildup in capacitors could result in the release of PCB's upon opening for treatment.
- Hammer mills are the standard method for breaking up capacitors prior to incineration. They create a PCB-contaminated dust problem which is difficult to control in a chemical system. Alternative methods for opening the cases must be used. Wet grinding, and shearing will be the main size reduction methods that will be looked at. In addition, the minimum amount of size reduction that is needed for chemical processing will be determined.
- Based on theoretical studies it appears paper may inhibit or slow down chemical destruction of PCB's. The Phase II research program will examine the degree of inhibition and if it proves to be unacceptable evaluate several methods of separating the PCB from the solids.
- The PCB-contaminated casing must be disposed of. The Phase II program will evaluate several methods of decontaminating the casing including a combined casing/core detoxification scheme and compare their efficiency and cost with simply filling the drained case with absorbant and disposing of it in a landfill.

This report describes a research program which will obtain the needed data for the design of a full-scale capacitor treatment demonstration unit. The Phase II program, has the following elements:

- Safe perforation of the capacitor shell and removal of the core
- Decontamination of the shell
- Decontamination of the PCB contaminated core and free PCB liquid. This can be accomplished by leaching PCB's from the core material using some form of solvent washing technique followed by chemical treatment of the PCB-contaminated solid or possibly the in-situ treatment of the mixed paper, metal and PCB's.

SECTION 1

INTRODUCTION

The disposal of capacitors containing polychlorinated biphenyl (PCB) dielectric fluids is a major problem for the electric utility industry. Before March 1, 1981, the Environmental Protection Agency (EPA) had permitted their disposal in chemical waste landfills. However, with the start of operation of the Energy Systems Corporation (ENSCO) incinerator in El Dorado, Arkansas, EPA ruled that sufficient capacity for the disposal of these capacitors was available and landfilling would no longer be permitted. Subsequently that utility industry has been skeptical that one facility has sufficient capacity to destroy all of its PCB capacitors. Aside from the Rollins facility in Texas, it is unlikely that additional incineration capacity will become available in the foreseeable future, hence, alternative technologies must be evaluated and developed.

In the past few months a technology utilizing the tetrahydrofuran/naphthalene complex of sodium metal has emerged as a promising approach for the destruction of PCB liquids and PCB-contaminated dielectric fluids. Several companies, including Acurex Corporation, have applied for and received permits to chemically treat these liquid PCB materials.

In addition, two companies have begun to accept PCB capacitors for processing. It is, however, unclear from available information whether these actually destroy the PCB or only extract it, leaving a PCB-free solid residue and concentrated PCB liquid, which must be disposed of by other means. Finally, a number of companies currently accept capacitors for storage under approved conditions. Some of these guarantee their destruction at some future date. As options like these become available to the electric utility industry, it is important that the facts are presented and evaluated so that each company can handle its capacitors as efficiently as possible.

This report presents the results of the first Phase of a two-Phase study to evaluate the feasibility of chemical processing of capacitors. The two Phases have the following objectives:

Phase I

- Perform a limited literature search to ensure that the latest technology is included in this program
- Acquire the necessary EPA and other permits for laboratory-scale research on PCB's
- Evaluate the legal and regulatory requirements necessary for this type of process
- Determine the best design for containment housings to handle the PCB capacitors

Phase II

- Construct the PCB containment housing in the laboratory
- Determine a safe method of perforating the capacitor shell to avoid worker and workplace contamination with PCB
- Determine whether rinsing is adequate for shell decontamination or if other decontamination procedures are needed
- Evaluate several potential methods for destroying PCB's in the capacitor core, both free liquid and that absorbed by the core material
- If these tasks are successful, determine the approximate cost of this treatment, including design and cost of a demonstration program
- Prepare final report

This preliminary study is intended to establish:

- If there is any information available in the scientific literature which could be useful in evaluating the available PCB capacitor cleanup processes or for development of new ones. For reasons discussed later in this report, the emphasis is placed on chemical destruction of PCB's.
- Types of legal and regulatory requirements this process must comply with
- Types of containment and handling equipment which will be required to properly protect workers and plant sites when processing PCB-containing capacitors in the field. This will include specifications for their design.

In addition, the results of this study have shown that further work, especially on chemical destruction would be useful to encourage the development of improved processes for the destruction of PCB capacitors. This report also describes the work plan for such further work, and the types of permits this research requires.

Before presenting the results of this preliminary study, it is worthwhile to describe the basic chemical PCB destruction process in use today.

1.1 CHEMICAL PCB DESTRUCTION METHOD

The chemical method used to destroy PCB's is well established and, theoretically, simple. It is well known that sodium can, in the presence of naphthalene and tetrahydrofuran, dechlorinate organic molecules such as PCB's. Work has been done in this area by several investigators since 1936, (1, 2, and 3). The procedure works as follows:

- Prepare a sodium reagent by mixing sodium metal with the proper amounts of naphthalene and tetrahydrofuran. This must be done under nitrogen, as air and water will react rapidly with sodium and deactivate the reagent. The reagent is referred to as sodium naphthalide and is represented in this report by the symbol Na*.
- The reagent is added to the PCB-contaminated material (or pure PCB) and the PCB destruction reaction is permitted to occur. This is a very critical step, as the dechlorination reaction is highly exothermic. If cooling or dilution is not provided, the reaction can become violent.
- After the reaction has taken place, the excess sodium is quenched with water, converting it to sodium hydroxide.

PCB's are destroyed via a reaction of the sodium naphthalide radical anion (Na*) with the organic chlorine. The reaction proceeds in steps, one chlorine removed at a time. The products are sodium chloride and a complex mixture of nonchlorinated polyphenyls, as well as the sodium hydroxide formed during the quenching of the excess sodium with water. The chemical reactions are illustrated in simplified form below:

$$Cl_4H_6(BP) + 2Na^* \longrightarrow Cl_3H_6(BP)Na^* + NaCl$$

$$Cl_3H_6(BP)Na^* + H_2O \longrightarrow Cl_3H_7(BP) + NaOH \text{ or}$$

$$2\ Cl_3H_6(BP)Na^* \longrightarrow Cl_3H_6(BP) - (BP)Cl_3H_6 + 2\ Na^*$$

These reactions illustrate what happens to a tetrachlorobiphenyl, identified here as $Cl_4H_6(BP)$. The term (BP) refers to the biphenyl structure. As shown, the product is either a trichlorobiphenyl or a dimer of two chlorobiphenyls. The sodium will continue to remove chlorine from these compounds until the nonchlorinated form is reached. At this point, the PCB molecule ceases to exist from both a legal and technical point of view. With proper design of the system, it is possible to achieve essentially complete destruction of the PCB, at least to the limit of measurement -- EPA considers this to be 2 ppm.

The basic process described above suffers from a number of drawbacks. The most significant is that naphthalene is classified as a "priority pollutant" under the Clean Water Act. Furthermore, its presence in any residue formed by the process could subject the residue to disposal limitations under the Resource Conservation and Recovery Act (RCRA). There are a number of chemicals available to replace naphthalene in this process. Since these variations are, however, considered proprietary, the subsequent discussion will focus on the use of naphthalene.

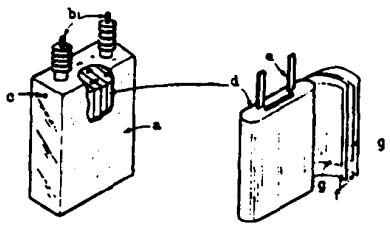
There appear to be no theoretical reasons why such chemical treatments cannot be used to decontaminate PCB capacitors. There are, however, many problems encountered in the actual handling of these solids. These problems, if not properly dealt with, can cause PCB contamination over wide areas, and utilities are not necessarily absolved of liability upon turning the capacitors over to a second party for disposal. Therefore, it is important that these issues and their solutions be clearly stated and understood.

1.2 PCB CAPACITOR STRUCTURE AND HANDLING

Capacitors are relatively simple electrical devices. They are usually rectangular, completely sealed metal containers with two procelain-insulated electrical connectors on the top. Figure 1-1 shows a bank of capacitors in a typical configuration. The interior of such a capacitor contains layers of conductor foil, typically aluminum, separated by plastic film or paper, these are rolled into a tight mass which occupies almost all of the capacitor's interior. A schematic view is shown in Figure 1-2. To improve the dielectric characteristics, provide cooling, and exclude air, these capacitors are filled under vacuum with pure PCB's. All solids inside the capacitor are completely saturated with PCB. In order to destroy the PCB's, it is necessary to open the capacitor.

Physically, opening the capacitor does not present a great difficulty; however, the capacitors occasionally accumulate small amounts of gas inside the core during normal use. This gas is under a slight, (although unknown) pressure and can cause free PCB liquid to spatter or spray out of the capacitor when it is punctured or ruptured. Therefore, it is necessary to pierce these capacitors in an enclosure to prevent contamination of workers and workplace. Incinerators cope with this problem by using a hammer mill to shred the whole capacitor prior to burning. This is not possible when using a chemical process, as there is no flame to vent the hammer mill dust. Equipment for piercing and opening the capacitors safely in the laboratory has been designed and is described in Section 4. The Phase II program will include (among other items) the design of a potential commercial-scale unit.

Figure 1-1. Photograph of a Typical Power Capacitor Bank



a. Capacitor shell
b. Porcelain bushing
c. Fill hole for dielectric fluid
d. Capacitor pack
e. Electrodes
f. Insulating file (paper or plastic)
g. Aluminum foil

Figure 1-2. Detail of a Typical Power Capacitor

Power capacitors are sized by KVAR (Kilovolt-Ampere-Reactance) and kV (kilovolt). This study will deal exclusively with power capacitors ranging in size from about 25 KVAR, 2,400V to about 450 KVAR, 7,200V. Specifying these two factors specifies the capacitor. It should further be noted that the results from this study should be applicable to most PCB capacitors. The size range was chosen largely because it represents the typical mix of capacitors employed by a utility.

The PCB content of these capacitors is a function of their size, manufacturer, and the year they were made. The Cincinnati Gas and Electric Company (CG&E) polled their capacitor suppliers to determine the amount of PCB's used. They examined capacitors ranging from 15 KVAR, and voltage applications of 2,400 to 7,200V. These capacitors were manufactured from 1950 to 1976 and included those manufactured by General Electric, Westinghouse, and McGraw Edison. The results for a given application, and year of manufacture, the PCB content was relatively constant regardless of the manufacturer. In addition, there was a steady reduction in the PCB content of the capacitors over the years. This reduction appears to be on the order of a factor of two and is noticeable throughout this time period -- even before PCB's were of environmental concern. The PCB content ranged from a low of 0.5 gal (1.9ℓ) to a high of 10.1 gal (38.2ℓ) PCB per capacitor. The majority of the units were found to contain a total of between about 2 and 4 gal (7.6 and 15.1ℓ) PCB.

On the basis of these capacitors, the chemical detoxification breaks down into the following steps:

1. Safe perforation of the capacitor shell and removal of the core
2. Decontamination of the shell
3. Decontamination of the PCB-contaminated core and free PCB liquid. This can be accomplished by leaching PCB's from the core material using some form of solvent washing, followed by chemical treatment of the PCB-contaminated solid or possibly in situ treatment of the mixed paper, metal, and PCB's.

1.3 ADVANTAGES OF CHEMICAL DESTRUCTION

A review of current literature on the subject shows there are many technologies capable of destroying PCB's (4). Some examples of these are:

- Combustion technologies
  - -- Liquid injection incinerators
  - -- Rotary kiln incinerators

- -- High efficiency boilers (for 50 to 500 ppm PCB's)
- -- Cement kilns
- -- Fluidized bed incinerator
- -- Molten salt incinerator
- -- Pyrolysis
- -- Ocean-based incineration

- Chemical technologies
  - -- Chemical oxidation
  - -- Chemical dechlorination
- Emerging technologies
  - -- Microwave plasma destruction

In spite of these options, there is a shortage of disposal capacity in the United States. This is due to the fact that the restriction on PCB disposal facilities is not technical, but social. Simply put, it is very difficult to site a facility handling PCB's. As a result, it is essential that any technology employed overcome objections to its emplacement. The objections raised to such facilities and the attributes that the technology must have to overcome these objections are described in the following paragraphs.

1.3.1 Exposure of New People to a Perceived Risk

This has been the most difficult problem to overcome. Basically, people perceive an increased risk from PCB disposal facilities and object to their placement in their neighborhood. Even if the people are convinced that the facility will destroy PCB's completely, they object to "the danger of shipping PCB's through their neighborhood." The problem boils down to the statement "Waste disposal facilities are needed and a good idea but not near where I live." It might be added that people five more miles from a proposed facility have been known to object because they feel it is too close to them. Even when existing industrial facilities (i.e., cement kilns, boilers, etc.) have been involved, there has been tremendous local citizen and government opposition. A direct result of this opinion is a concern for a decrease in the property values. After all, a perceived risk does make this property less desirable. The ideal PCB destruction technology is one which is capable of being moved or located at the site where the PCB wastes are being stored.

1.3.2 Verification of Destruction

This problem is best summarized by the statement "We're sure you can destroy PCB's during the test when all these scientists and engineers are running the process, but how can we be sure you will destroy them during operation? We all know that breakdowns occur." In addition, there are the problems associated with hazardous products of combustion, materials such as chlorodibenzofurans and chlorodioxins which form, or are suspected of forming, when PCB's are burned. Combustion is largely an uncontrolled chemical process. As a result, almost any organic material can conceivably be formed. While such an extreme concern seems unwarranted, it must, nevertheless, be considered in the selection of a technology. The technology of choice should utilize well understood and controllable destruction methods. Furthermore, it should operate in a batch mode, making it possible to chemically analyze the outflows prior to release or discharge.

1.3.3 Dispersion of Pollutants

Gaseous emissions are released from some sort of stack which is often associated with heavy volumes of noxious smoke. This contributes to making people who live miles from the facility fearful of it. In order to overcome these concerns, the ideal PCB destruction technology should have no gaseous emissions, and only small volumes of aqueous effluent.

It is recognized that no technology is capable of managing all forms of PCB's and while satisfying successful implementation criteria. However, as the following discussions will show, there are certain technologies which, for specific important applications, come very close to meeting the ideal criteria.

Chemical treatment is the only method currently available which can overcome the previously mentioned problems. As a liquid Phase system, it is very compact and can be readily made mobile. In this way, it can be taken onsite, instead of transporting PCB's to a new location. Furthermore, unlike combustion systems, it produces essentially no emissions or smoke and only small amounts of solid waste or aqueous discharges. Finally, the liquid Phase reaction is readily controlled, and it is possible to analyze each batch of material treated for PCB prior to discharge. In this way, it can be assured that the PCB's are destroyed and none inadvertantly discharged.

SECTION 2

LEGAL AND REGULATORY REQUIREMENTS

The bulk of the pertinent PCB regulations that apply to a facility for destroying PCB's in capacitors are given in the Federal Register of May 31, 1979 (5). The background document (6) for these regulations is also an important source of information on PCB handling and disposal methods. According to these regulations, the only presently acceptable method for disposal of PCB capacitors is incineration in an "Annex I" incinerator. The name comes from the fact that the specifications for PCB incinerators are given in "Annex I" of these regulations. The EPA Regional Administrators are given the authority to allow alternative methods of disposal if they are essentially equivalent in destruction, and not present a hazard to health and the environment. Chemical destruction of PCB's is being approved via this discretionary authority of the administrator of each of the ten EPA regions.

To date, chemical treatment has only been approved for transformer oils containing up to 1,000 ppm PCB. As a result, the required degree of destruction and conditions imposed on such permits will have a direct impact on the environmental requirements for a capacitor treatment system.

Incinerators have been shown to result in PCB destruction in excess of 99.9999 percent. Therefore, to show similar destruction levels, the product oil from a wet chemical process woul have to contain less than 1 ppm PCB at a 100 percent PCB input. The sensitivity of the currently available analytical methods (gas chromatograph with an electron capture detector -- GC/EC) is 1 to 2 ppm. Since the input PCB will not be pure, it is impossible to demonstrate PCB destruction "equivalent" to an Annex I incinerator. The policy that EPA has adopted, however, is that a PCB destruction process is acceptable if the PCB concentration in the effluent streams is "unmeasurable" using an acceptable GC/EC technique.

This is an impossible situation for solids such as capacitors, since the PCB concentration in a solid can be measured to a far greater sensitivity than that in transformer oil. The method for measuring PCB in transformer oil is simply to dilute the oil with 10:1 hexane for viscosity reduction. This is followed by a

cleanup using an adsorbent or acid wash to remove impurities (if necessary) and injecting it into the GC/EC. The GC/EC is sensitive only to the total quantity of PCB injected. The total volume of sample injected is fixed by constraints on the GC. As a result, there is no way of increasing the system's sensitivity beyond 1 to 2 ppm PCB.

The PCB content of a solid is found by first extracting the PCB with a suitable solvent. The extraction is normally carried out using a Soxhlet extractor, a device that contains a reservoir of solvent below a bed of PCB-contaminated solid -- paper in this case. The low boiling solvent (methanol or hexane) is boiled and allowed to condense above the solid bed, dripping through the bed and leaching the PCB's. When solvent accumulates to a level above the contaminated solid, that quantity of solution is drained back into the solvent reservoir. Solvent continues to be recycled with PCB's accummulating in the reservoir. The extract containing the PCB's is then analyzed using a GC/EC. Clearly the amount of PCB's in the initial sample of paper is a function of the sample size, as a result, PCB's in the parts per billion (10^{-9}) or lower range can be detected. Because of the ubiquitous nature of PCB's, it is possible to identify PCB's in "non-PCB" materials in this manner. However, it is impossible to say that the solid stream is literally "PCB-free."

Criteria for what is considered to be a "PCB-free" solid do not exist at present. Strong cases could be made, however, for the following to be considered PCB-free:

- Solids containing less than 50 ppm PCB by weight
- Solids containing less than 1 to 2 ppm PCB by weight
- Solids are subjected to a leaching test with the extract containing less than 1 to 2 ppm PCB

The justification for the first criterion is simply that the cutoff for PCB-contaiminated material is 50 ppm. Any material with less than 50 ppm PCB may legally be disposed of in a sanitary (nonhazardous) waste landfill if it does not have any other hazardous constituents or properties. Furthermore, PCB regulations allow a PCB-contaminated transformer oil (over 50 ppm PCB) to be cleansed to below 50 ppm using an adsorption or absorption process and thereby made into a non-PCB oil. EPA has subsequently indicated (8) that this is only applicable if PCB's are being physically removed from the oil. If PCB's are being destroyed, as with a chemical process, the final product must contain less than a detectable amount of PCB's, 1 to 2 ppm. If this argument is used the residue paper and metal could,

most likely, not be reused but would have to be disposed of in a sanitary or chemical waste landfill.

The justification for the second argument (that solids are considered to be PCB-free if they contain less than 1 to 2 ppm PCB) lies simply by analogy to PCB-contaminated transformer oils. At 1 to 2 ppm PCB, there are restrictions on the oil. A process which brings the PCB concentration in an oil down to this level is acceptable, hence a process which brings it down to the same level in a solid should also be acceptable.

The final criterion for a PCB-free solid (an extract containing less than 1 to 2 ppm PCB) is based on the fact that the PCB-free solids would most likely be disposed of in a landfill. This type of test can be used to determine whether a waste is or is not hazardous under the Resource Conservation and Recovery Act. By a logical extension, therefore, it should be reasonable to use the same test for PCB-containing materials.

The previously mentioned criteria are all possible "end points" for a capacitor detoxification process. Clearly, no one can predict what EPA's interpretation of the regulations would be for a particular application, however, it appears, based on informal discussions with EPA personnel that the second or third criterion will be the one most likely used. These two result in approximately the same level of PCB removal from the capacitor solids.

An important recent development is the awarding of a temporary permit to process PCB capacitors by EPA Region VI to Environmental International, Inc. of Kansas City, Missouri. While process information for the operation is proprietary and unavailable, the permit indicates that the processing will "reduce the volume of PCB material which must be stored." The permit also specifies that a PCB-free material is one whose PCB content is less than 2 ppm (assumed by weight). At least one other company (SED, Inc. of Waukesha, Wisconsin) is developing a scheme for removing PCB from capacitors using a leaching technique, and then storing the PCB until a destruction method is available. It therefore appears that it can be assumed that a material is PCB-free if it contains less than 1 to 2 ppm PCB.

One further regulatory point should be discussed here. There are many companies who will accept capacitors for indefinite storage at their facilities. Some merely store them, others offer to destroy them at some future date. Environmental International and, possibly, SED offer to concentrate and store the PCB until it

can be destroyed. It is strongly recommended that legal counsel be consulted before using such services. According to EPA's interpretations of the PCB laws and regulations, it does not appear to be possible to transfer liability for PCB to another party; hence the current owner must be assured that the material, in whatever form, is properly stored and disposed of. Liability is eliminated, of course, if the PCB's are actually destroyed.

2.1 REQUIREMENTS FOR RESEARCH

The PCB regulations require that all research conducted with PCB's must be approved by the Regional Office of EPA. Such approval is obtained by submitting a request to the Regional Administrator explaining the type of research to be performed. The request should include the following:

- Description of the types of research to be performed
- Description of the laboratory and its facilities for proper handling of PCB's
- A plot plan or photo of laboratory surroundings
- Quantities of PCB's to be handled
- Purpose of the research

This information has been submitted to EPA for our laboratory. EPA approval was recieved on December 30, 1981.

SECTION 3

LITERATURE SEARCH

As a first step to performing this study, a literature search was undertaken to determine what type of data was available in current literature on the treatment of PCB capacitors. The search sought to uncover any work that had been done on the following:

- PCB destruction with sodium reagents and other chemical means
- Leaching of PCB from paper using solvent
- Solubility of PCB in organic solvents
- Mass transfer of PCB in organic solvents

3.1 COMPUTER LITERATURE SEARCH

As a first step, a series of computer literature searches were performed. These searches were performed using the following key-words:

- PCB's or polychlorinated biphenyls
- Leach or leaching
- Diffusion
- Destruction
- Concentration
- Attenuation
- Adsorption

The searches were conducted on various combinations of these key-words and generated approximately 130 "hits." Of these, the vast majority of references dealt with PCB's in the ecosystem and their toxicology.

Two reports (9 and 10) were discovered which dealt with PCB's from capacitor applications. The first (9) discussed sampling at a PCB capacitor filling operation and was not found to be of use to this project. The second (10) was a

report of PCB emissions from the capacitor shredding operation at the ENSCO incineration facility at El Dorado, Arkansas. This report showed that PCB emissions around the hammer mill used to shred the capacitor could be a potential workplace health hazard. Therefore, they supported the contention that hammer mills are an unacceptable method of opening capacitors in a nonincinerator application because of the PCB-contaminated dust problem. This will be discussed in greater detail in the following sections.

3.2 OTHER LITERATURE SEARCHES

Acurex files and standard references were also searched for any applicable information. This uncovered only one reference that pertains to the handling of PCB capacitors specifically, and many references dealing with the general leaching of substances from a solid matrix.

The reference dealing with the handling of PCB capacitors was a public release from SED, Inc. of Waukesha, Wisconsin. SED claims to be developing methods for separating PCB from other materials, such as natural gas pipeline condensate, transformer oils, fuels, and capacitors. While the details of the processes used are proprietary, they do seem to be combinations of standard chemical refining processes, such as distillation, adsorption, and leaching.

The process described by SED for the treatment of capacitors is a shredding of the capacitor followed by a Soxhlet extraction of the residue using methanol. The PCB can be readily separated from the methanol, which is reclaimed in a separate subsystem. SED claims to be able to produce a "PCB-free" paper and metal (the degree of cleanliness is not specified) product suitable for reclaiming or recycling, as well as pure PCB liquid which they will store pending destruction at some future date. No cost data was given for this treatment. It should be pointed out that Soxhlet extraction is a common laboratory and industrial technique for leaching material from an inert solid matrix. It is described in section 2 and will be discussed further in Section 4.2.

An area of the literature search which proved fruitful was identification of methods which predict leaching bed behavior (11). Since leaching is one of the oldest unit operations of chemical engineering, reliable equations exist that can be used to predict this type of systems behavior. Unfortunately, information could not be found on distribution coefficients for PCB's between paper and a solvent such as methanol or hexane. As a result, these calculations can only be used for

scoping calculations. Additional data is needed to use them for design purposes. This will be discussed further in Sections 5.4.2 and 5.5.

SECTION 4

CAPACITOR PROCESSING

Once the capacitor housing has been breached, there are two possible methods which can be used for PCB destruction. The first, conservative, approach is separation of the PCB using a solvent extraction or leaching scheme followed by a sodium naphthalide treatment of the PCB-contaminated solvent. The second approach, which has not been described in the literature, is treating of the PCB-contaminated core material as a slurry. The core material consists largely of paper or plastic film and aluminum with possible small amounts of other metals, all contaminated with PCB. The metals will not affect the PCB destruction process; however, the effect of the paper is unclear. Laboratory experience indicates that paper appears to be relatively inert to sodium; however, one may infer from chemical structure of cellulose, the principal constituent of paper, that at least some chemical reactions should occur. This question is discussed in greater detail in Sections 4.4 and 5.6. Needless to say, significant cost reductions would result should PCB destruction prove possible without separating the PCB's from the other core material. It may even prove possible to destroy the PCB's in the capacitor directly, thereby eliminating the need for cracking, shredding, and rinsing of the casing.

The following sections will discuss the fundamentals and information gaps associated with:

- Piercing and opening of casing
- Leaching and rinsing of casing and core materials
- Destruction of PCB liquid
- Possibility of treating total capacitor without first leaching out PCB's

4.1 PIERCING AND OPENING

As discussed previously, a fraction of the capacitors which need to be disposed of contain a small amount of gas under pressure. When the capacitors are pierced, this gas could result in a PCB spray that could contaminate workers and processing equipment, and result in PCB releases to the environment. The hammer mill at a

capacitor incineration facility was found to be a source of PCB dust (10). It should be noted that the dust from a hammer mill associated with an incinerator or other combustion equipment is normally suppressed by maintaining a negative pressure and venting the discharge to the furnace as combustion air. This is clearly not possible when operating a chemical process, since no combustion air is used.

If a hammer mill is used to shred the capacitors prior to treatment, it is necessary to vent it to an air pollution control device that can capture PCB-contaminated dust. Fabric filters, while very effective for dust suppression, do not work well when the dust is oily, as in this case. The PCB would coat the bags and clog them. Scrubbers could be designed to remove the dust, but their use would result in a PCB-contaminated liquid stream which would need to be treated. Electrostatic precipitators might be effective, but there is little information on their efficiency in removing such a very high resistivity dust. There does not appear to be a satisfactory dust suppression system available for a hammer mill processing PCB capacitors.

Phase II of this research program will compensate for this by attempting to either eliminate the shredding of the capacitors altogether or reduce it by determining the minimum amount of shredding the capacitors would require.

Should capacitors shredding prove to be required (at whatever level) it will be necessary to examine the various methods available. Various designs will need to be evaluated to determine which are likely to be the most practical for this application.

Alternatives to hammer mills are available. A promising option is a wet milling system (under oil instead of water) that would utilize grinding rather than impaction. The material produced is of a less uniform particle size than that from a hammer mill, but this type of grinder would produce far less dust. Another option is a shearing mechanism that merely cuts the capacitor open and dumps the core out in several large pieces. The Phase II program will evaluate these options and recommend a shredding system that meets the needs of a chemical PCB destruction operation.

4.2 LEACHING AND RINSING

There are two activities that fall under this heading. First, unless the capacitor is treated in one piece or shredded whole, it is necessary to decontaminate the

empty case prior to disposal. Methods of achieving decontamination need to be evaluated. Second, the core material, if it cannot be treated as a mass with the sodium reagent, needs to be leached with solvent to remove PCB's.

The decontamination of the case involves more than simple rinsing with solvent. To illustrate, Napier (12) conducted an informal experiment in which he filled a steel pipe with PCBs and let it sit for a time. He then drained and rinsed it in the manner required to decontaminate PCB transformers, and refilled the pipe with non-PCB dielectric fluid. This was allowed to sit for 90 days. The dielectric fluid tested for PCB, and showed significant PCB contamination. This does not mean that it is impossible to decontaminate the empty capacitor shell. However, the procedure may require a great deal of time and/or solvent and may be impractical.

A useful tool for aiding the cleaning of the case is ultrasonic cleaning. The limiting factor in rinsing of the case is the diffusion rate of the PCB molecule from the walls into the bulk solvent. Ultrasonic cleaning is a well established tool for aiding this type of diffusion, and can substantially reduce solvent usage. Its efficiency will be explored in the research program.

An alternative method of decontaminating the shell may be to simply rinse it with sodium reagent, since it does not appear to contain any component which would inhibit the PCB destruction reaction. This area needs further investigation.

Finally, it may be desirable to treat the empty shell in the same manner as a drained PCB-transformer shell. That is, after removal of the core, the shell is triple-rinsed with solvent, filled with a non-PCB solid, absorbent, and then landfilled. This approach, while probably not the preferred option, must be considered as an alternative should the Phase II studies show that rinsing to cleanlinesss is too costly.

Separating PCBs from the paper and metal in the capacitor core is a far more difficult problem than decontamination of the metal shell. The PCB's are tightly bound to the highly absorbent core material. There seems to be little question that it can be removed through a leaching operation, possibly using some form of reboiling extraction system. The question is whether the energy or solvent requirements and time needed to achieve the necessary level of separation can make such a process practical.

There are several ways of performing this type of leaching. The simplest, of course, is to simply mix a volume of PCB-saturated core material with a volume of suitable solvent, such as hexane or other organics. The PCB will, in time distribute itself between the paper and solvent, then the mass can be filtered to separate a partially cleaned solid from the PCB-contaminated solvent. The process can be repeated with new solvent to further reduce the PCB content of the solid mass.

Clearly, the number of leaching steps which will be required to achieve a given final PCB concentration is a function of many factors. The most important are:

- Volume of solvent for each leaching stage
- PCB concentration in the original solid material
- Distribution coefficient of PCB's between the solid and liquid phases
- Time permitted for each leaching step

To understand the importance of each of these factors it is possible to perform a scoping calculation. Assume that a mass of solid (say $1m^3$) containing 10 percent PCB by volume is mixed with an equal volume ($1m^3$) of a solvent such as hexane. This material is then allowed to stand, possibly with some stirring until equilibrium is reached, and is then filtered.

Even though the partition coefficient is not known, it is still possible to estimate the degree of cleaning which would result by assuming that the composition of the liquid remaining absorbed in the solid mass is the same as that of the filtrate. In this case, one wash would result in approximately a tenfold reduction in the PCB concentration of the solid. Ideally then, about six washings would be required to achieve a PCB concentration of less than 1 ppm. If the quantity of solvent is doubled, the same effect would be obtained with about five washings. Similarly, if the solid contained 20 percent PCB (instead of 10) a 1 ppm product requires only about seven washings. Clearly, these are not significant factors. In fact, it can be shown that the only significant factor is whether the leaching liquid can be intimately contacted with the PCB-contaminated solid in a practical way. If such contact can be achieved, a final solid product containing less than 1 to 2 ppm PCB is readily achievable.

There are several methods of further reducing the quantity of solvent required. The most common method would be the use of a countercurrent extraction process whereby the contaminated solvent from one batch is used to leach the material in

another, higher PCB concentration batch. This is shown schematically in Figure 4-1. Another method for reducing the quantity of solvent required is by re-refining it. A simple method of doing this is analogous to the percolator method of making coffee. The PCB-laden solid material is placed in a bed above a reboiler filled with the solvent. The solvent is boiled and vapor is allowed to condense above the bed. The condensed solvent percolates through the solid and carries the PCB's into the reboiler. Since PCB's have a high boiling point, they will tend to remain in the reboilder while the solvent, hexane for example, will continue boiling up through the bed. At the conclusion, the solvent can be readily reclaimed by a simple distillation, leaving behind pure PCBs. Because of the very low PCB concentration that must be achieved in the solid, each batch will have to be processed with two to three "percolations."

There appear to be several methods readily available for removing PCBs from the capacitor cores. The question is not one of "is it possible," but rather of practicality and cost for the alternatives available.

4.3 IN SITU PCB DESTRUCTION

There appears to be no scientific reason to prevent the opening and shredding of PCB capacitors, followed by leaching out of the PCB's using a solvent such as hexane. The PCB's can then be chemically destroyed. The more processing a decontamination scheme requires, however, the greater the cost. Clearly, it is worthwhile to attempt to eliminate the leaching step by direct treatment of PCB-contaminated solid material with the sodium reagent.

The process to be explored can be:

- Pierce the capacitor to relieve any pressure which may have built up
- Open case and remove core material
- Shred core material and mix with a diluent such as hexane
- Treat the slurry with a sodium reagent to destroy the PCB's

This approach can work if the core does not contain any material that will inhibit the PCB destruction reaction. The sodium reagent is a very strong reducing agent, and will readily reduce water, releasing hydrogen. It will also react with alcohols, acids, and many other organic compounds containing an -OH structure.

The core material, does not contain water, hence this will be of little concern. The metallic components will not affect the reaction. The insultating materials

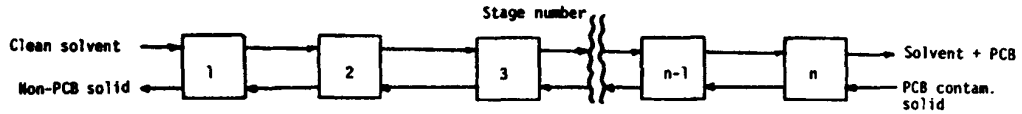
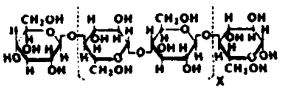


Figure 4-1. Schematic of Countercurrent Leaching Operation

inside the capacitors are either polypropylene or paper. Polypropylene is also inert; however, paper may react with the sodium and possibly inhibit the PCB destruction.

Paper is principally cellulose, a polymeric material of the following general composition.



The sodium could, in theory, attack the -OH groups on the molecule rather than the PCB. While this is a concern, it does not preclude the treatment of the slurry. The sodium, in attacking both the cellulose and PCB's participates in two competing reactions. The PCB attack has been found to be very rapid. One would expect the cellulose attack, since it is a heterogeneous reaction, to occur far more slowly.

In fact, a quick test with dry paper and sodium (under nitrogen) revealed no noticeable attack. This test is far from conclusive but it is very encouraging. We have, in addition, successfully filtered a sample of reagent through filter paper and little or chemical reaction was observed.

As a result, all the available data indicates that it will be possible to destroy the PCB's in the capacitor without having to leach it out of the solid matrix. Should the paper prove to inhibit the PCB destruction, it would still be possible to combine a leaching with a PCB destruction system and achieve significant overall reductions in the cost of PCB capacitor decontamination.

SECTION 5

PHASE II PROGRAM PLAN

All of the work completed to date has shown that the chemical treatment of PCB capacitors appears possible. The program now moves into its second phase, verification and determination of treatment cost. This will involve construction of specialized laboratory facilities to open and handle PCB capacitors, as well as performance of a research program to do the following:

- Construct the PCB containment housing in the laboratory
- Determine a safe method of perforating the capacitor shell to avoid PCB contamination of worker and workplace
- Determine whether rinsing is adequate for shell decontamination or if other decontamination procedures are needed
- Evaluate several potential methods for destroying PCB's in capacitor cores, both free liquid and that absorbed by the material of the core
- If these tasks are successful, determine the approximate cost of such a treatment and design and cost of a demonstration program
- Prepare the final report

5.1 LABORATORY DESCRIPTION

The technical program will not involve the purchase or construction of large pieces of processing equipment. An "isolated" laboratory to handle contaminated materials will be necessary, and it is currently under construction in Cincinnati, Ohio at no cost to EPRI. The construction of this laboratory is continually being reviewed by our in-house safety engineer who will assure compliance with Occupational Safety and Health Administration (OSHA) and Department of Health requirements.

Because of the nature of the capacitors, it will be necessary to install special equipment within the laboratory to pierce and open the capacitors. As discussed earlier, these capacitors may have accumulated internal pressure, therefore the containment housing must be constructed to handle the sudden discharge of PCB materials should one of the capacitors be under pressure. There are no openings in

capacitors, so it is impossible to determine whether any given unit is under pressure prior to perforation. These enclosures will be built as part of Phase II. They are described in Section 5.2.

These special enclosures are the only pieces of equipment beyond routine laboratory ware which will have to be purchased or built for this program.

The purchase of chemicals will include sodium metal, naphthalene, tetrahydrofuran, and other solvents necessary for core PCB extraction tests.

The laboratory itself is (shown in Figure 5-1) a sealed room with a seamless polyethylene liner floor that can contain a PCB spill and be readily cleaned. The liner is laid in such a manner as to form a dike completely around the PCB handling area. The walls and ceiling are coated with a special, impermeable paint that can be readily washed down. The areas where PCB materials will be sorted and handled are further shrouded with polyethylene sheeting. This arrangement makes decontamination in the event of a PCB spill or spray very easy. This laboratory design has been submitted to EPA and approval for research is expected by January 1, 1982.

5.2 CONSTRUCTION OF CONTAINMENT HOUSINGS

These housings are necessary to contain any possible PCB discharges when the capacitors are pierced and handled. The first requirement is a housing which can be used to pierce the capacitor and contain any resulting spray (see Figure 5-2).

The housing is made out of an open-leaf 55-gal drum, modified so that a sharpened 1/4-in. (0.6-cm) steel rod passes through a packed gland in the head. The rod is placed on top of the capacitor and rapped with a hammer, piercing the case. Any PCB spray released will be contained in the drum. All materials of construction are compatible with solvents used, as well as with the sodium reagent. As a result, this system will be easy to decontaminate at the conclusion of the research.

The capacitor will be opened in a second enclosure. This enclosure is made of clear plastic. It is approximately 4 ft x 4 ft x 2 ft (1.2m x 1.2m x 0.6m). One of the 4 ft x 4 ft walls (1.2m x 1.2m) is pierced with flexible gloves creating a totally sealed "glove-box" effect. All processing of the capacitors solids will take place inside this glove-box (see Figure 5-3).

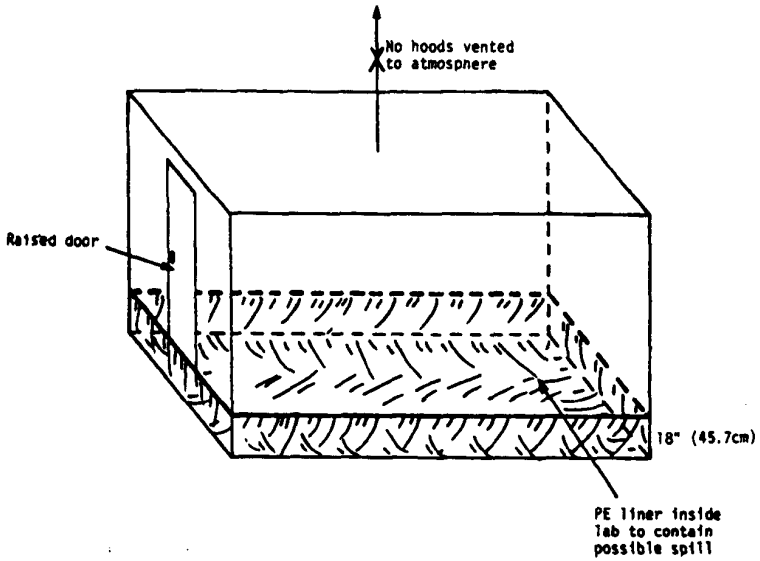


Figure 5-1. Test Laboratory

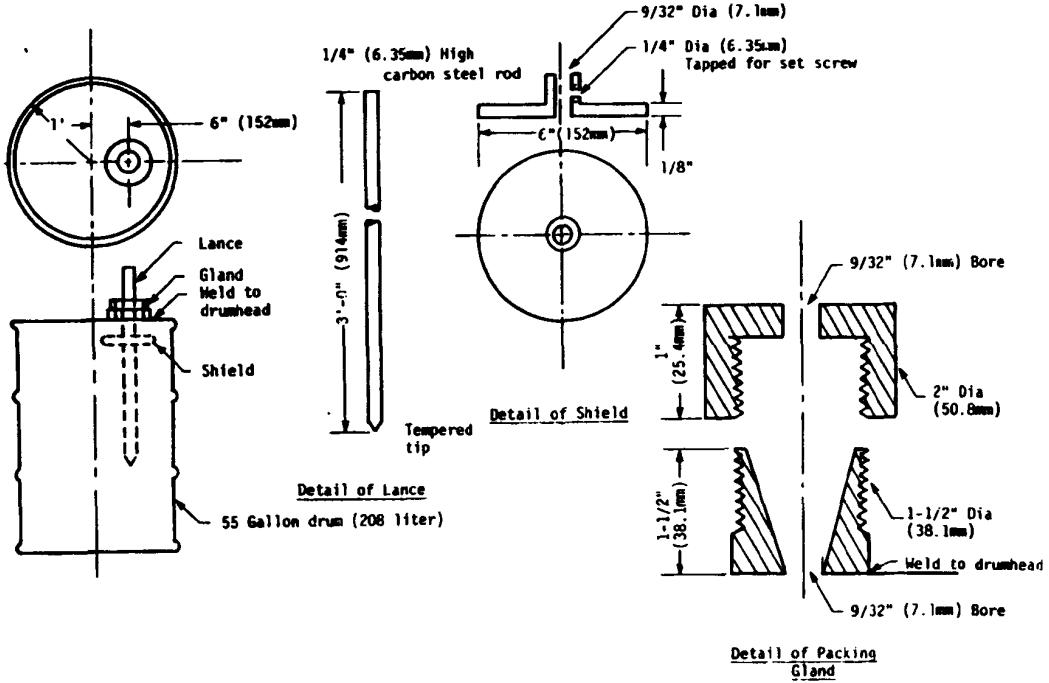


Figure 5-2. Capacitor Piercing System

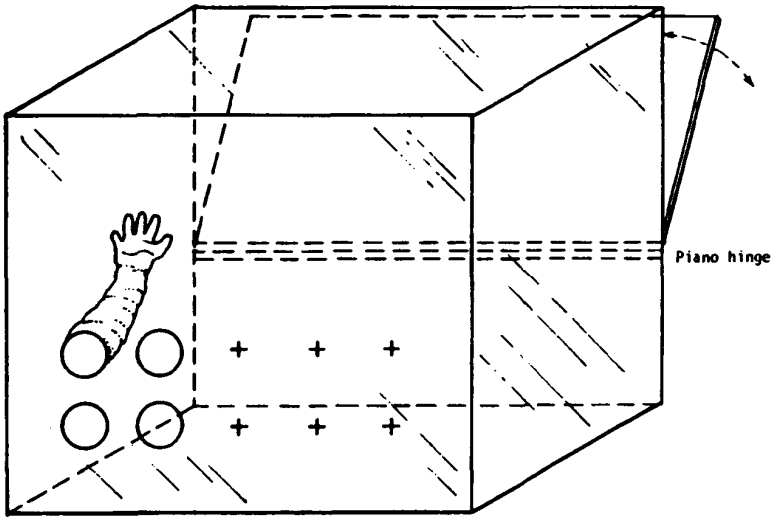


Figure 5-3. Glove Box for Handling Capacitors

In order to properly process the PCB material, several different types of hand tools and laboratory equipment will become contaminated with PCB. These are restricted to small items such as a saw or a liquifier (blender) to open the capacitor and shred the core material. Because these tools and laboratory equipment will be contaminated with PCB's, it is expected that they will have to be discarded or decontaminated at the end of the experimental program. Acurex will be responsible for the safe and legal disposal of contaminated equipment.

5.3 CAPACITOR PERFORATION AND SHREDDING

The goal of this program is a safe, reliable means of opening and shredding (if necessary) capacitors so that they can be readily subjected to chemical treatment. This program will be coordinated with the two decontamination programs to determine the most efficient combination of shredding and treating.

The current method of shredding of capacitors is by passing the whole capacitor through a hammer mill. This, while convenient, is not necessarily the best approach. Hammer mills work best on materials of approximately the same friability. Capacitors are a mixture of metal (from the shell), paper, or plastic film and foil. The hard metal can be separated from the soft core material without a large amount of processing. In doing so, much of the dust produced by the hammer mill is eliminated. The objective will be to keep the case as intact as possible and remove the cores. The following possible approaches to this will be investigated.

- Pierce the capacitor to relieve pressure, then cut off the top and use a shredding wheel to remove the core; alternately, cut the capacitor into several pieces
- Drill several holes along the top of the capacitor and insert high-speed chopping blades (much like blender blades on a shaft) into the core to liquify it

Clearly, these are very general approaches and represent only the first step in an iteration to arrive at the optimum shredding techniques.

The physical properties of the capacitors' component parts will be examined and compared to the specifications for a variety of commercially available shredding or size reduction equipment. This will set the specifications for designing full-scale equipment. In addition, the results of the laboratory shredding program will be evaluated to determine whether a custom-designed size reduction system is likely to be more appropriate for this application.

The results of this size reduction research will be integrated with that of the leaching and PCB destruction test for the design of the full-scale demonstration plant.

5.4 SHELL DECONTAMINATION

Once the core has been removed from the capacitor, it is necessary to prepare the shell for disposal, preferably in a normal (nonchemical waste) landfill or by reclamation. Three known methods can be used:

- Triple-rinse the shell with a non-PCB solvent, fill with absorbent and discard in a secure landfill. Then treat the liquid with sodium naphthalide to destroy the PCB's. Primary solvents for consideration are THF, hexane, and kerosene. The use of ultrasound as an aid to decontamination will be explored.
- If there are no materials associated with the shell to inhibit the PCB destruction reaction, decontamination may be possible by simply treating the shell with sodium naphthalide reagent.
- Subject the shell to an extraction to reduce its PCB concentration to below the EPA limit of detection, 2 ppm PCB. The shell material can then be reclaimed or disposed of in a regular sanitary landfill.

The Phase II program will evaluate these options.

The shell will be cut into 6-in. x 2-in. (15.2-cm x 10.2-cm) tabs and each of these tabs will be subjected to a rinsing procedure using various amounts of different solvents, with and without ultrasonic cleaning. The quantity of solvent used for each tab will be computed on the basis of solvent (ml) per square centimeter of surface to be cleaned. In this way, it will be possible to relate the results of these tested tabs back to the whole capacitor case. This approach is necessary so as to minimize the number of capacitors which must be handled. This approach will also eliminate capacitor to capacitor variations which could make results difficult to interpret.

To determine whether triple rinsing the capacitor shell is an effective decontamination method the tabs will be triple-rinsed with an appropriate volume of each solvent under consideration. Each rinsate will be analyzed for PCB's. The rinsed shell material will be subjected to a Soxhlet extraction (as described in Section 2) to determine the amount of PCB residue remaining.

The second approach, decontamination with direct treatment of sodium reagent will be investigated by placing the tab into an appropriate volume of sodium reagent.

These tests will be conducted using successively lower amounts of reagent to determine the minimum reagent needed to reduce the PCB concentration to below 2 ppm by weight.

The final set of tests are similar to the previously mentioned tests to be performed in the triple rinsing tests. These, however, will be performed using different types of solvents until the PCB concentration in the solvent is less than 2 ppm -- the EPA limit of detectability. These tests, along with ancillary PCB solubility tests, will be used to design a leaching system for the full-scale demonstration.

5.5 CORE DECONTAMINATION

The Phase II research program is intended to achieve an optimum capacitor treatment system design. Ideally, the program will identify a scheme whereby PCB's will be destroyed without the leaching process. The first step will be to test that approach by performing a series of tests to establish whether treatment without leaching out PCB's is possible.

These tests will consist of the following:

- Remove a sample of PCB-contaminated core material and shred finely in a blender
- Treat this material with the sodium reagent and detemine levels of PCB destruction achieved, reagent usages and times involved

The tests will be performed at various levels of reagent addition. It is expected that the results of one test will lead to the design of other experiments. As a control, the free liquid removed from the capacitor will also be subjected to sodium treatment.

This series of tests will also evaluate whether the diluents used affect PCB destruction. Among the diluents that will be investigated are hexane, kerosene, and tetrahydrofuran.

The results of this set of tests will determine whether direct sodium reagent treatment or preleaching will be used for the rest of this program. If the previously mentioned tests are successful, the leaching tests will be minimized and the majority of the effort will focus on optimizing destruction conditions for PCB's in a heterogeneous medium. If it proves impossible to achieve good PCB

destruction in the heterogeneous medium, then the effort will focus on developing an optimum PCB leaching/destruction cycle.

The two alternative programs are described in Sections 5.5.1 and 5.5.2.

5.5.1 Direct PCB Destruction

This research scheme will be followed if the preliminary tests show that it is possible to destroy PCB's without first separating from the core material. The program steps are:

A. Perform a series of experiments, starting at a high reagent concentration, to determine the minimum amount of reagent needed to treat a finely chopped sample of the core material. These will be done at successively low reagent addition so as to develop a relationship between reagent concentration and reaction completion.

B. At the minimum reagent addition rate, perform a series of experiments to establish the minimum grinding the capacitor core material will require for treatment.

C. Determine what methods exist for achieving the desired degree of capacitor core size reduction while still in the case. Therefore, the case and core material can be decontaminated in one step.

D. Perform a limited number of leaching tests on the core material to determine mass transfer rates and other leaching parameters to permit the design of leaching systems. In addition, a dual-system leaching followed by PCB treatment will be evaluated.

5.5.2 Leach and Process Route

This research approach will be used if the results of step A, on the previous page, show that PCB cannot be destroyed when mixed with the core material.

E. Perform a series of experiments designed to determine the mass transfer and equilibrium parameters for the leaching of PCB from the capacitors. This will be done using three different solvents.

F. At the optimum solvent usage, determine the minimum amount of grinding that the capacitor material will require.

G. Determine whether it is possible to grind the capacitor core sufficiently while it is still in the case. This will make it possible to decontaminate the core and case in one step.

H. Compare the effects solvent types used on the subsequent PCB destruction reaction.

5.6 DESIGN DEMONSTRATION PROGRAM

If the laboratory tests indicate that capacitors can be safety and satisfactorily destroyed using the described chemical approach, the results will be condensed and incorporated into a proposal program for commercial scale demonstration of the technology. A cost estimate and schedule will be included.

SECTION 6

CONCLUSIONS

This preliminary study has shown that there are no physical or chemical reasons why PCB capacitors cannot be decontaminated by chemical means. The question is strictly a matter of "practicality." Chemical detoxification methods are currently revolutionizing the area of PCB transformer oil treatment, largely because of their mobility (they can be used onsite, hence no siting problems) and they are more cost-effective than incineration. Chemical detoxification of capacitors appears to offer the same advantage.

At present there is insufficient information available to properly design, build, and operate practical PCB capacitor detoxification systems. The Phase II research program described in this report will research, develop, and design the full-scale capacitor opening processing equipment necessary for this system. It will also provide the information needed to select an optimum decontamination scheme for the case and to destroy PCB's, rather than to merely extract them from the solids and store it.

The research plan developed is flexible. It strives to achieve a breakthrough, the direct chemical destruction of PCB's in capacitors. It also has provisions, using existing technology, for achieving success should unexpected problems prevent such direct PCB destruction. Therefore, there is a maximum probability for the successful development of a usable chemical detoxification system for PCB capacitors.

REFERENCES

1. Scott, N. D., J. F. Walker and V. F. Hansley, J. American Chemical Society 58, 2442-2444 (1936).

2. Smith, G. and G. L. Bubbar, The Use of Sodium Naphthalenide to Chemically Destroy PCB by Dechlorination, ibid.

3. Brown, J. F., M. E. Lynch, J. C. Carnahan, and J. Singleton, Chemical Destruction of PCB in Transformer Oil, ibid.

4. Weitzman, L., Treatment and Destruction of PCB and PCB Contaminated Material, Paper presented to the Division of Environmental Chemistry, American Chemical Society, New York, N. Y., August 1981.

5. Federal Register, "Polychlorinated Biphenyls (PCBs) Manufacturing Processing, Distribution in Commerce and Use Prohibitions," Vol. 44, No. 106, May 31, 1979,

6. Environmental Protection Agency, Office of Toxic Substances, "Support Document/Voluntary EIS and PCB Manufacturing, Processing, Distribution in Commerce, and Use Ban Regulation: Economic Impact Analysis," April 1979.

7. Electric Power Research Institute, Disposal of Polychlorinated Biphenyls (PCB's) and PCB-Contaminated Materials, FP1207, Volume 1 October 1979.

8. Kuntz, G., W. Gunther, US EPA, Washington, D.C., Personal Communications.

9. Haile, C. L. and E. Baladi, Methods for Determining the Total PCB Emissions from Incineration and Capacitor - and Transformer - Filling Plants, EPA-600-4-77-048, November 1981.

10. Rodes, C. E., M. D. Jackson and R. G. Lewis, Monitoring for PCB Emissions from an Electrolytic Capacitor Disposal Project, EPA-600/4-78-025, May 1978.

11. Perry, Chilton and Kirkpatrick, Perry's Chemical Engineers' Handbook, Fourth Edition, McGraw Hill, 1963.

12. Napier, J. M., Personal Communications (1980).

APPENDIX A

RESULTS OF COMPUTER LITERATURE SEARCH

```
Set Items Description
  1    385 PCB OR POLYCHLORINATED(W)BIPHEN
  2   1000 LEACH?
  3      2 1AND2
  4  13007 DIFFUS?
  5    910 DESTRUCTION
  6  11100 CONCENTRATION
  7   5436 ATTENUATION
  8   3522 ADSORPTION
  9  33071 4 OR 5 OR 6 OR 7 OR 8
 10  34830 9OR2
 11     99 1AND10

Print 11/2/1-99

Search Time:  0.101   Prints:  99   Docs.:  9
```

PB81-222721 NTIS Prices: PC A20/MF A01

Manual of Analytical Quality Control for Pesticides and Related Compounds in Human and Environmental Samples

Lafayette Coll., Easton, PA. Dept. of Chemistry.*Environmental Protection Agency, Research Triangle Park, NC. (0116888001)

AUTHOR: Sherma, Joseph
6480104 Fld: 7D, 68E*, 99A* GRA1B122
Apr 81 400p*
Rept No: EPA-600/2-81-060
Contract: EPA-68-02-2474
See also Jan 79, PB-288 711.

Descriptors: *Pesticides, *Chemical analysis, *Quality control, *Manuals, Sampling, Gas chromatography, Performance evaluation, Thin layer chromatography, Separation, Urine, Residues, Carbamates, Extraction, Concentration(Composition), Extractions, Phosphorus organic compounds

Identifiers: High performance liquid chromatography, Polychlorinated biphenyls, NTISEPA600D

PB81-221079 NTIS Prices: PC A02

Uptake of Polychlorinated Biphenyls by Natural Phytoplankton Assemblages: Field and Laboratory Determination of 14C-PCB Particle-Water Index of Sorption

State Univ. of New York at Stony Brook. Marine Sciences Research Center.*National Oceanic and Atmospheric Administration, Rockville, MD. Office of Sea Grant. (0145360014)

AUTHOR: Biggs, D. C.; Powers, C. D.; Rowland, R. G.; O'Connors, M. B. Jr; Wurster, C. F.
6498492 Fld: 6F, 8A, 6C, 68D, 47D, 57C, 06M dB122
c1980 12p
Monitor: NOAA-81042918
Pub. in Environmental Pollution (Series A), v22 p101-110 1980. Prepared in cooperation with Texas A and M Univ., College Station.

Descriptors: *Phytoplankton, *Long Island Sound, Chlorine organic compounds, Estuaries, Growth, Particles, Concentration(Composition), Diatoms, Reprints

Identifiers: *Polychlorinated biphenyls, Water pollution effects(Plants), *Bioaccumulation, Sea Grant program, Skeletonema costatum, Particulates, NTISCERI80A

PB81-208223 NTIS Prices: PC A06/MF A01

Factors Affecting the Bioavailability of Polychlorinated Biphenyls (PCBs) in Soils

North Carolina State Univ. at Raleigh.*Office of Water Research and Technology, Washington, DC. (055200000)

AUTHOR: Strek, Harry John
Masters' thesis
6487182 Fld: 8H, 68E, 46E, 68D GRA1B121
1980 100p
Project: OWRT-B-122-NC
Monitor: OWRT-B-122-NC(5)

Descriptors: *Soil analysis, *Bioassay, Soil properties, Chlorine organic compounds, Sands, Activated carbon, Absorption, Pesticides, Clays, Theses, Leaching, Plants(Botany), Isotopic labeling, Slope, Ionic mobility, Solubility, Moisture content, Soil pressure, Weeds, Water pollution

Identifiers: *Polychlorinated biphenyls, *Aroclor 1254, *Path of pollutants, Organic matter, NTISOWRT, NTISOIOWRT

PB81-202756 NTIS Prices: PC A06/MF A01

Environmental Assessment of Physical/Chemical Impacts Related to the Dredging and Disposal of Spoil from the Proposed Trench Tube Crossing of the Anacostia River

Ecological Analysts, Inc., Sparks, MD.*Washington Metropolitan Area Transit Authority, DC. (073412000)

AUTHOR: Pine, Frank W.; Yost, Jonathan C.; Saul, Stephen W.; Wood, Sarah G.
Data rept. (Final) May 80-Feb 81
6478582 Fld: 13B, 68C, 68D, 68E GRA1B120
Mar 81 125p
Rept No: EA-PBS-01K
Sponsored in part by Washington Metropolitan Area Transit Authority, DC.

Descriptors: *Solid waste disposal, *Water pollution, Assessments, Anacostia River, Concentration(Composition), Pesticides, Chlordan, DDT, Iron, Mercury(Metal), Sediments, Sites, Regulations, Tables(Data), Potable water, Ground water, Sampling

Identifiers: *Dredge spoil, *Solid wastes, *Water pollution sampling, Polychlorinated biphenyls, NTISWMATA, NTISWMATA

PB81-198487 NTIS Prices: PC A07/MF A01

Atmospheric Chemistry of PCBs and PAHs. Volume 9

Wisconsin Univ.-Madison. Water Resources Center.*Environmental Protection Agency, Chicago, IL. Great Lakes National Program Office. (048049136)

AUTHOR: Andren, A. W.; Doskey, P. V.; Strand, J. W.
Final rept. 1974-79
6487BL4 Fld: 13B, 68E, 68A, 68D GRAI8119
Mar 80 126p
Grant: EPA-R-806142
Monitor: EPA-905/4-79-029-I

Descriptors: *Air pollution, *Lake Michigan, *Pesticides, *Water pollution, Particles, Transport properties, Deposition, Sampling, Concentration(Composition), Vaporization, Volatilization, Flux(Rate)

Identifiers: *Polychlorinated biphenyls, *Air-water interfaces, Aroclor 1242, Aroclor 1254, XAD-2 resin, Aroclor 1260, Numerical solution, NTISEPAELA, NTISEPAELA

PB81-187270 NTIS Prices: PC A03/MF A01

Evaluation of PCB Destruction Efficiency in an Industrial Boiler: Audit Report

Research Triangle Inst., Research Triangle Park, NC.*Industrial Environmental Research Lab., Research Triangle Park, NC. (045968000)

AUTHOR: Calling, P. F.; Hunt, G. F.
Final rept. Aug-Sep 80
6486JH4 Fld: 13B, 68E*, 68A GRAI8118
Apr 81 25p*
Contract: EPA-68-02-3146
Monitor: EPA-600/2-81-068B

Descriptors: *Air pollution, *Auditing, *Boilers, Chlorine organic compounds, Flue gases, Performance evaluation, Industrial wastes, Sampling, Michigan

Identifiers: *Polychlorinated biphenyls, Bay City(Michigan), NTISEPA08B

PB81-187197 NTIS Prices: PC A17/MF A01

Effectiveness of Activated Carbon for Removal of Toxic and/or Carcinogenic Compounds from Water Supplies

Michigan Univ., Ann Arbor. Dept. of Environmental and Water Resources Engineering.*Municipal Environmental Research Lab., Cincinnati, OH. (000797312)

AUTHOR: Weber, Walter J. Jr; Pirbazari, Massoud
Final rept. Apr 76-Mar 80
6447GA4 Fld: 13B, 68D GRAI8117
Apr 81 393p
Grant: EPA-R-804369
Monitor: EPA-600/2-81-057

Descriptors: *Water treatment, *Activated carbon, Carbon tetrachloride, Benzene, Chlorine organic compounds, Adsorption, Humic acid, Potable water, Graphs(Charts), Laboratory equipment, Performance evaluation

Identifiers: *Toxic substances, Polychlorinated biphenyls, Dieldrin, Benzene/dichloro, Organic matter, Ethane/dichloro, NTISEPA08D

PB81-182339 NTIS Prices: PC A14/MF A01

Guidelines for the Disposal of PCBs (Polychlorinated Biphenyls) and PCB Items by Thermal Destruction

TRW, Inc., Redondo Beach, CA.*Industrial Environmental Research Lab., Research Triangle Park, NC. (006784000)

AUTHOR: Ackerman, D. G.; Scinto, L. L.; Bansal, P. S.; Belmunes, R. G.; Johnson, R. J.
Final rept. Oct 79-Apr 80
6446SJ1 Fld: 13B, 68E, 68C, 68A, 43F GRAI8117
Feb 81 319p
Contract: EPA-68-02-3174
Monitor: EPA-600/2-81-022

Descriptors: *Pesticides, *Incinerators, *Guidelines, *Regulations, *Solid waste disposal, Combustion products, Industrial wastes, Design criteria, Performance evaluation, Sampling, Air pollution control

Identifiers: *Polychlorinated biphenyl, *Liquid wastes, NTISEPA08D

PB81-178287 NTIS Prices: PC A03/MF A01

Facilities Evaluation of High Efficiency Boiler Destruction PCB Waste

TRW, Inc., Redondo Beach, CA.*Industrial Environmental Research Lab., Research Triangle Park, NC. (0067840D0)

AUTHOR: Cotter, J. E.; Johnson, R. J.
Research brief Jan-Apr 80
B438474 Fld: 13B, 68C GRA1B116
Mar 81 46p
Contract: EPA-68-02-3174
Monitor: IERL-RTP-1108A

Descriptors: *Solid waste disposal, *Grease, Fats, Combustion, Boilers, Chlorine aromatic compounds, Performance evaluation

Identifiers: *Biphenyl/perchloro, *Polychlorinated biphenyls, *Incineration, Rendering plants, NTISEPA0RD

PB81-178847 NTIS Prices: PC A03/MF A01

Health Hazard Evaluation Report No. 80-88-748, Pacific Gas and Electric Company, Oakland, California

National Inst. for Occupational Safety and Health, Cincinnati, OH. Health Hazard and Technical Assistance Branch. 0836780I3)

AUTHOR: Pryor, P.
B4123B3 Fld: 6J, 6T, 57U, 57Y, 84D, 68G GRA1B114
Sep 80 16p
Rept No: HHSSH-HE-80-88-748

Descriptors: *Hazardous materials, *Industrial medicine, *Environmental surveys, Chlorine organic compounds, Exposure, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Concentration(Composition), Thresholds(Physiology), Surveys, Electric power plants, Safety

Identifiers: *Toxic substances, *Occupational safety and health, Air sampling, Maximum permissible exposures, CAS 1336-36-3, Polychlorinated biphenyls, Monitoring, NTISHEWOSH

PB81-181861 NTIS Prices: PC A07/MF A01

Field Study to Obtain Trace Element Mass Balances at a Coal-Fired Utility Boiler

Tennessee Valley Authority, Chattanooga. Div. of Energy Demonstrations and Technology.*Industrial Environmental Research Lab., Research Triangle Park, NC. (0211120I0)

AUTHOR: Evers, Robert; Sanderfriff, V. E.; Zielke, R. L.
Final rept. May 75-Sep 80
G4014J1 Fld: 7D, 68A, 98A GRA1B113
Oct 80 146p
Monitor: EPA-600/7-80-171

Descriptors: *Mass flow, *Trace elements, *Air pollution, Field tests, Aromatic polycyclic hydrocarbons, Boilers, Industrial wastes, Combustion products, Chemical analysis, Gas analysis, Particles, Electric power plants, Chlorine organic compounds, Concentration(Composition), Sampling, Electric power plants

Identifiers: *Coal fired power plants, Air pollution detection, Polychlorinated biphenyls, NTISEPA0RD

PB81-182902 NTIS Prices: PC A06/MF A01

PCB Residue Levels in Human Adipose Tissue; a Statistical Evaluation by Racial Grouping

Research Triangle Inst., Research Triangle Park, NC.*Environmental Protection Agency, Washington, DC. Office of Toxic Substances. (0459680D0)

AUTHOR: Lucas, Robert M.; Erickson, Mitchell D.; Piserchia, Phil V.; Williams, Stephen R.
Final rept.
G3986F4 Fld: 6T, 6F, 57Y, 57E GRA1B113
Nov 80 103p
Contract: EPA-68-01-5848
Monitor: EPA-560/13-79-015

Descriptors: *Pesticides, *Toxicology, Regression analysis, Insecticides, Chlorine organic compounds, Humans, Demography, Concentration(Composition), Design, Chemical analysis

Identifiers: *Polychlorinated biphenyls, *Pesticide residues, Monitoring, *Toxic substances, Race, NTISEPA0TS

PB81-180883 NTIS Prices: PC A16/MF A01

Concentration Technologies for Hazardous Aqueous Waste Treatment

Tenhill, Shoukrow and Associates, Inc., Pittsburgh, PA.=Municipal Environmental Research Lab., Cincinnati, OH. (072306000)

AUTHOR: Shoukrow, Alan J.; Pojak, Andrew P.; Cohoke, Jerome W. Interim rept.
6384JG Fld: 13B, 68C= GRAI8111
Feb 81 356p=
Contract: EPA-68-03-2706
Monitor: EPA-600/2-81-019

Descriptors: =Hazardous materials, =Chemical compounds, Dialysis, Density(Mass/volume), Separation, Crystallization, Precipitation(Chemistry), Concentration(Composition), Technology, Alcohols, Aliphatic hydrocarbons, Distillation, Centrifugation, Catalysis, Design criteria, Aromatic polycyclic hydrocarbons, Phthalates, Phenols, Amines, Aromatic compounds, Halogen organic compounds, Pesticides, Evaporation, Filtration, Flocculation, Ion exchanging, Adsorption, Solvent extraction, Membranes

Identifiers: =Liquid wastes, Biological industrial waste treatment, Polychlorinated biphenyls, Reverse osmosis, Ultrafiltration, NTISEPA08D

PB81-132831 NTIS Prices: PC A03/MF A01

Nearshore Chemistry in the Vicinity of the Grand River, Michigan

National Oceanic and Atmospheric Administration, Ann Arbor, MI. Great Lakes Environmental Research Lab. (032606006)

AUTHOR: Chambers, Richard L.; Eadie, Brian J.
Technical memo.
6337414 Fld: 8H, 68D, 48G, 68M GRAI8106
Jan 80 34p
Rept No: NOAA-TM-ERL-GLERL-28
Monitor: NOAA-80110402

Descriptors: =Water pollution, =Grand River, Sampling, Phosphorus, Biphenyl, Chlorine organic compounds, Zinc, Nickel, Lead(Metal), Concentration(Composition), Carbon, Nitrogen, Seasonal variations, Lake Michigan, Sediments

Identifiers: =Water quality data, Polychlorinated biphenyls, NTISCOMNOA

PB81-112526 NTIS Prices: PC A06/MF A01

Evaluation of Suspected Environmental Contamination of the Hemlock, Michigan Area

Environmental Protection Agency, Chicago, IL. Region V. (032306016)
6336IJ1 Fld: 13B, 6T, 68D, 57Y GRAI8106
Sep 80 77p
Rept No: EPA-905/4-80-006

Descriptors: =Aquifers, =Toxicity, =Water pollution, Sampling, Water supply, Potable water, Pesticides, Arsenic, Cadmium, Lead(Metal), Chlorine organic compounds, Biphenyl, Soils, Tissues(Biology), Bioassay, Bromine organic compounds, Concentration(Composition), Michigan

Identifiers: Polybrominated biphenyls, Biphenyl/bromo, Polychlorinated biphenyls, Biphenyl/chloro, Hemlock(Michigan), NTISEPA01A

PB81-117798 NTIS Prices: PC A06/MF A01

Ambient Water Quality Criteria for Polychlorinated Biphenyls

Environmental Protection Agency, Washington, DC. Criteria and Standards Div. (031207472)
6316403 Fld: 6T, 6F, 8A, 57Y=, 57U, 68G=, 68D, 47D GRAI 8104
Oct 80 200p=
Rept No: EPA-440/5-80-068

Descriptors: =Water quality, =Toxicology, Chlorine organic compounds, Toxic tolerances, Laboratory animals, Criteria, Toxicity, Water pollution, Aquatic biology, Marine biology, Fresh water biology, Concentration(Composition), Exposure, Carcinogens, Public health, Risk, Food, Experimental data, Plants(Botany), Pesticides

Identifiers: =Toxic substances, =Water pollution effects(Humans), Water pollution effects(Animals), Water pollution effects(Plants), Environmental health, Health risks, Maximum permissible exposure, Pharmacokinetics, Clean Water Act, =Polychlorinated biphenyls, Biphenol/perchloro, NTISEPA08P

PB81-112080 NTIS Prices: PC A06/MF A01

Maximum Utilization of Water Resources in a Planned Community: Contributions of Refractory Compounds by a Developing Community

Rice Univ., Houston, TX. Dept. of Biology.*Municipal Environmental Research Lab., Cincinnati, OH. (013977019)

AUTHOR: Fisher, F. M.
Final rept. Sep 73-Dec 76
G2900304 Fld: 6H, 68D, 48G, 91A GRAI8103
Aug 80 82p
Grant: EPA-800432
Monitor: EPA-600/3-80-113
See also PB80-116308.

Descriptors: *Surface water runoff, *Urban areas, Water pollution, Chlorohydrocarbons, Biphenyl, Chlorine organic compounds, Lakes, Chlorine aliphatic compounds, Insecticides, Concentration(Composition), Soil analysis, Texas

Identifiers: Polychlorinated biphenyls, Chlordan, Mirex, Houston(Texas), NTISEPA08D

PB81-105464 NTIS Prices: (Order as PB81-105413, PC A10/MF A01)

Organochlorine Residues in Fishes from the Northwest Atlantic Ocean and Gulf of Mexico

National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center. (034391012)

AUTHOR: Stout, Virginia F.
G3800423 Fld: 6A, 68D, 47D, 88G GRAI8103
Aug 79 9p
Monitor: NOAA-80080806-4
Included in Fishery Bulletin, v78 n1 p61-68 1980.

Descriptors: *Chlorohydrocarbons, *Fishes, *Water pollution, Biphenyl, Chlorine organic compounds, Dieldrin, Residues, DDT, Concentration(Composition), Biscayne, North Atlantic Ocean, Mexico Gulf, Reprints

Identifiers: *Pesticide residues, Polychlorinated biphenyls, NTISCOMMF

PB80-221989 NTIS Prices: PC A04/MF A01

Water-Quality Assessment of the Cypress Creek Watershed, Warrick County, Indiana

Geological Survey, Indianapolis, IN. Water Resources Div. (068571001)

AUTHOR: Bobo, Linda L.; Peters, Charles A.
Final rept. Mar-Aug 79
G2605903 Fld: 6H, 8I, 68D, 48G, 97R GRAI8025
May 80 74p
Rept No: USGS/WRD/WRI-80/039; USGS/WRI-80-35
Prepared in cooperation with Soil Conservation Service, Washington, DC.

Descriptors: *Coal mining, *Mine waters, *Sulfates, *Cypress Creek Watershed, *Water pollution, Conductivity, Nutrients, Chlorohydrocarbons, Iron, Calcium sulfates, Magnesium, Manganese, DDT, Biphenyl compounds, Standards, Concentration(Composition), Indiana

Identifiers: *Mine acid drainage, Polychlorinated biphenyls, Biphenyl/chlorol, Warrick county(Indiana), NTISDIGSWR, NTISAGSCS

PB80-219652 NTIS Prices: PC A06/MF A01

Attenuation of Water-Soluble Polychlorinated Biphenyls by Earth Materials

Illinois State Geological Survey, Urbana.*Municipal Environmental Research Lab., Cincinnati, OH. (012568000)

AUTHOR: Griffin, R. A.; Chian, E. S. K.
Final rept.
G2435B4 Fld: 13B, 68 GRAI8024
May 80 104p
Grant: EPA-R-804684-01-0
Monitor: EPA-600/2-80-027
Prepared in cooperation with Georgia Inst. of Tech., Atlanta. School of Civil Engineering.

Descriptors: *Hazardous wastes, *Biphenyl, Biodeterioration, Adsorption, Chlorine organic compounds, Degradation, Microorganisms, Solubility, Mobility, Volatility, Pollution, Soils, Rocks, Plants(Botany), Water

Identifiers: *Polychlorinated biphenyls, Aroclor 1242, NTISEPA08D

PB80-204373 NTIS Prices: PC A17/MF A01

Water-Related Environmental Fate of 129 Priority Pollutants. Volume I: Introduction and Technical Background, Metals and Inorganics, Pesticides and PCBs

Versar, Inc., Springfield, VA.;Environmental Protection Agency, Washington, DC. Office of Water Planning and Standards. (8003730001)

AUTHOR: Callahan, Michael A.; Slimak, Michael W.; Gabel, Norman W.; May, Ira P.; Fowler, Charles F.
Final rept.
6217104 Fld: 13B, 68D• GRAI8022
Dec 79 388p•
Contract: EPA-68-01-3852
Monitor: EPA-440/4-79-029A
Sponsored in part by Grant EPA-68-01-3867. Prepared in cooperation with SRI International, Menlo Park, CA. _See also Volume 2, PB80-204381._

Descriptors: •Water pollution, Transport properties, Concentration(Composition), Metals, Inorganic compounds, Pesticides, Chlorine organic compounds

Identifiers: •Path of pollutants, Polychlorinated biphenyls, NTISEPAGWP

PB80-203864 NTIS Prices: PC A04/MF A01

Transference Mechanism of Polychlorinated Biphenyl by Aquatic Organisms

Georgia Inst. of Tech., Atlanta. Environmental Resources Center.;Office of Water Research and Technology, Washington, DC. (8103630071)

AUTHOR: Maudy, M. K.
Technical completion rept. Oct 77-Jan 80
6216304 Fld: 6F, 8F, 57Y, 68D GRAI8022
Jan 80 61p
Rept No: ERC-01-80
Contract: 01-14-34-0001-8011
Project: OWRT-A-073-GA
Monitor: OWRT-A-073-GA(1)
Prepared in cooperation with Georgia Univ., Athens. Coll. Experiment Station.

Aquatic biology, Concentration(Composition), Chlorine organic compounds, Cultures(Biology), Food chains, Sediments, Water pollution, Bacillus, Larvae

Identifiers: •Polychlorinated biphenyls, •Bioaccumulation, Depuration, •Water pollution effects(Animals), NTISDIOWRT

PB80-216716 NTIS Prices: PC A05/MF A01

The Distribution and Abundance of Polychlorinated Biphenyls in Surface Waters of Bloomington, Indiana

Indiana Univ. at Bloomington. Dept. of Geology.;Office of Water Research and Technology, Washington, DC. (8509940201)

AUTHOR: Epstein, Mark L.
Master's thesis
6186413 Fld: 7D, 68A, 98A GRAI8019
May 79 82p
Contract: DI-14-34-0001-7256
Project: OWRT-C-7681(7256)
Monitor: OWRT-C-7681(7256)(1)

Descriptors: •Water analysis, Chlorine organic compounds, Water pollution, Chemical analysis, Samples, Gas chromatography, Solvent extraction, Surface water, Concentration(Composition), Runoff, Sites, Indiana, Theses

Identifiers: •Polychlorinated biphenyls, •Bloomington(Indiana), •Path of pollutants, •Water pollution detection, NTISDIOWRT

K/C-1303 NTIS Prices: PC A02/MF A01

Management of Polychlorinated Biphenyls at the ORGDP. Environmental Protection

Oak Ridge Gaseous Diffusion Plant, TN.;Department of Energy, Washington, DC. (4830000)

AUTHOR: Long, L. W.
6182303 Fld: 13B, 6B GRAI8019
22 Apr 80 9p
Contract: W-7405-ENG-26

Descriptors: •Aromatics, •Organic chlorine compounds, Cost, Drugs, Regulations, Waste management

Identifiers: ERDA/053000, ERDA/400000, ERDA/050501, NTISDE

PB80-175084 NTIS Prices: PC A08/MF A01

Treatment of Hazardous Waste. Proceedings of the Annual Research Symposium (6th) Held at Chicago, Illinois on March 17-20, 1980

Southwest Research Inst., San Antonio, TX.;Municipal Environmental Research Lab., Cincinnati, OH. (0144H1000)

AUTHOR: Shultz, David; Black, David
Final rept. Oct 79-Sep 80
6130882 Fld: 13B, 68C- GRAI8015
Mar 80 183p
Monitor: EPA-600/9-80-011
See also report dated Mar 80, PB80-175084.

Descriptors: *Solid waste disposal, *Hazardous materials, *Meetings, Sampling, Pollution control, Encapsulation, Concentration(Composition), Inorganic compounds, Chlorine organic compounds, Technology, Pesticides, Evaporation, Economics, Thermal degradation

Identifiers: *Solid waste management, Polychlorinated biphenyls, Land pollution, NTISEPA08B

PB80-187174 NTIS Prices: PC A02/MF A01

Hazard Evaluation and Technical Assistance Report TA 79-58, Montana State Department of Health, Pierce Packing Company, Billings, Montana

National Inst. for Occupational Safety and Health, Cincinnati, OH. Health Hazard and Technical Assistance Branch. (0526780I3)
6133241 Fld: 6J, 6T, 57U, 57Y, 94B, 68G GRAI8015
Jun 80 8p
Rept No: NIOSH-HE/TA-79-58
See also report dated Jun 79, PB80-153698.

Descriptors: *Hazardous materials, *Industrial medicine, Exposure, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Concentration(Composition), Sampling, Contaminants, Chlorine organic compounds

Identifiers: *Toxic substances, *Occupational safety and health, Air sampling, Billings(Montana), Polychlorinated biphenyls, NTISHEUSH

PB80-187885 NTIS Prices: PC A02

Uptake and Distribution of 2,5,2',5'-Tetrachlorobiphenyl in Developing Lake Trout

Wisconsin Univ.-Milwaukee.;National Oceanic and Atmospheric Administration, Rockville, MD. Office of Sea Grant. (0468G3000)

AUTHOR: Broyles, Robert H.; Novack, Martin I.
6094314 Fld: 6T, 6C, 68B, 57Y, 57I, 96A GRAI8012
c1979 11p
Rept No: WIS-SG-79-706
Monitor: NOAA-80021507
Pub. in Toxicology and Applied Pharmacology, v50 p291-298 1979.

Descriptors: *Trout, *Toxicity, *Water pollution, Eggs, Chlorine organic compounds, Adsorption, Exposure, Isotopic labeling, Tissues(Biology), Accumulation, Great Lakes, Reprints

Identifiers: Sea Grant program, *Polychlorinated biphenyls, Biphenyl/chloro, Salvelinus namaycush, NTISCONNOA

PB80-193184 NTIS Prices: PC A06/MF A01

Evaluation of Protocols for Pesticides and PCB's in Raw Wastewater

Little (Arthur D.), Inc., Cambridge, MA.;Municipal Environmental Research Lab., Cincinnati, OH. (0162230O0)

AUTHOR: Caragay, Alegria B.; Levins, Philip L.
Final rept. Jun-Oct 78
6084114 Fld: 7D, 68D, 99A GRAI8011
Nov 79 112p
Contract: EPA-68-01-3857
Monitor: EPA/600/2-79-186

Descriptors: *Pesticides, *Water analysis, Sewage treatment, Chemical analysis, Sampling, Solvent extraction, Gas chromatography, Mass chromatography, Separation, Concentration(Composition), Chlorine organic compounds

Identifiers: *Polychlorinated biphenyls, Procedures, NTISEPA08D

PB-299 406/0ST NTIS Prices: PC A02/MF A01

Effects of Arsalar (Trade Name) 1240 and 1300 on the Fathead Minnow ('Pimephales promelas')

Environmental Research Lab.-Duluth, MN. (0494740000)

AUTHOR: Defoe, D. L.; Veith, G. D.; Carlson, R. W.
Journal article
F2300E1 Fld: 6T, 6F, 8C, 57Y, 68B, 57Z GRAI7935
11 Apr 78 8p
Rept No: EPA/600/J-78/136
Monitor: 18
Pub. in Jnl. of the Fisheries Research Board of Canada, v35 n7 p997-1002 1978. Summary in French.

Descriptors: *Fishes, *Minnows, *Toxicology, Bioassays, Experimental data, Larvae, Concentration(Composition), Males, Females, Water pollution

Identifiers: *Toxic substances, Polychlorinated biphenyls, *Bioaccumulation, *Water pollution effects(Animals), NTISEPAGRD

PB-296 803/0ST NTIS Prices: PC A10/MF A01

Polychlorinated Biphenyls: Ambient Water Quality Criteria

Environmental Protection Agency, Washington, DC. Criteria and Standards Div.
F1793B4 Fld: 6I, 6F, 8A, 57I*, 57U, 68G*, 68D, 47D GRAI 7920
1978 202p*
Monitor: 18

Descriptors: *Water quality, *Toxicology, Chlorine organic compound, Pesticides, Toxic tolerances, Laboratory animals, Criteria, Toxicity, Water pollution, Aquatic biology, Marine biology, Fresh water biology, Concentration(Composition), Exposure, Carcinogens, Public health, Risk, Food, Experimental data, Plants(Botany)

Identifiers: *Toxic substances, *Water pollution effects(Humans), Water pollution effects(Animals), Water pollution effects(Plants), Environmental health, Health risks, Maximum permissible exposure, Pharmacokinetics, Clean Water Act, NTISEPAGWP

PB-298 749/6ST NTIS Prices: PC A13/MF A01

Selected Water-Quality Records for Texas Surface Waters, 1971 Water Year: Biochemical-Oxygen-Demand, Dissolved-Oxygen, Nutrients, Pesticides, Minor Elements, and Other Related Chemical and Biological Analyses

Texas Water Development Board, Austin.;Geological Survey, Reston, VA.

AUTHOR: Schulze, Joan A.; Dupuy, Alton J.; McPherson, Emma
Annual rept. Oct 70-Sep 71
F1789H2 Fld: 13B, 68D GRAI7920
Aug 73 281p
Rept No: TDWR/R-176
Monitor: 18
Prepared by Geological Survey, Reston, VA.

Descriptors: *Surface waters, *Water pollution, *Texas, Metals, Ions, Biochemical oxygen demand, Oxygen, Dissolved gases, Pesticides, Biphenyls, Chlorine organic compounds, Concentration(Composition), Phenols, Turbidity, Tables(Data)

Identifiers: Polychlorinated biphenyls, *Water quality data, NTISSLRS

PB-296 978/0ST NTIS Prices: PC A09/MF A01

Trace Organic Analysis: A New Frontier in Analytical Chemistry

National Bureau of Standards, Washington, DC. (240 900)

AUTHOR: Hertz, Harry S.; Chesler, Stephen N.
Final rept.
F1605F4 Fld: 7D, 6H, 6F, 99A*, 6B, 98H, 57D, 86V GRAI7918
Apr 78 138p*
Rept No: NBS/SP-519
Monitor: 18
Proceedings of the Materials Research Symposium (9th) Held at Gaithersburg, Maryland on April 10-13, 1978. Library of Congress catalog card no. 78-600061.

Descriptors: *Organic compounds, *Trace elements, *Chemical analysis, *Meetings, Electrochemistry, Sampling, Nutrients, Ecosystem, Drugs, Toxicity, Bioassay, Food additives, Gas chromatography, Mass spectroscopy, Biological extracts, Hormones, Environmental surveys, Gas analysis, Water analysis, Aromatic polycyclic hydrocarbons, Carbohydrates, Soil analysis, Chloromethanes, Pesticides, Pentanes, Concentration(Composition), Aerosols, Tissues(Biology)

Identifiers: Air pollution detection, Water pollution detection, Liquid chromatography, State of the art, Polychlorinated biphenyls, Vitamin B, High performance liquid chromatography, Hexane, NTISCOMM$