

Subject Index

A

- Alfalfa
 - midge culture, 393-400
- Algae
 - rapid-chronic toxicity tests, 253, 255-260, 256, 257(tables)
- Algal food
 - daphnid culture, 368-369
 - midge culture, 393-400
- Ampelisca abdita* (See Amphipods)
- Amphipods
 - chronic toxicity tests
 - chlorinated hydrocarbons, 315-327
 - dredged sediments, 289-303, 295-297(tables), 304-313, 310, 312(tables), 315-327, 320(table)
 - reproduction, 300-302, 301(table)
- Analysis of variance (ANOVA)
 - amphipod mortality, 309
 - Standardized Aquatic Microcosm, 161-162, 166-168, 170-171
 - survival/reproduction of midges, 395, 396, 398(tables)
- Anesthetics, properties of, 69-70
- Anilines
 - fish acute toxicity syndrome
 - rainbow trout, 63(table), 63-68
 - polar narcosis effects
 - fathead minnows, 61(table), 62(table)
- Antibodies
 - cross-reactivity of, 23-33
 - immunoassays, 21-23
- Arbacia punctulata*
 - rapid-chronic toxicity tests, 252-253, 255-260, 257(table)
- Artemia*, 413-422
 - Artemia reference center, 413
- ASTM Committee E 47
 - Biological Effects and Environmental Fate, 208
 - Subcommittee E 47.01, 1
 - role in test method standardization, 12
- ASTM Standards
 - E 1203:, 413
 - E 1022-84:, 263
- Atrazine
 - field vs laboratory testing, 200-202, 201(table)
 - Mixed Flask Culture, 200-202

- Standard Aquatic Microcosm, 200-202
- Avoidance/preference tests
 - fish, 34-45, 35(illus), 38, 39, 40(tables)
 - invertebrates, 34-45, 36(illus), 40, 41(tables)

B

- Bacillus subtilis*
 - in laser/microbe bioassay system, 96-103
- Bacillus thuringiensis*
 - microbial pest control, 225-238
 - Mixed Flask Culture, 226-238
- Bacteria (See *Bacillus subtilis*; *Bacillus thuringiensis*)
- Behavioral abnormalities
 - fish exposed to mexacarbate, 271, 281
- Behavioral bioassay
 - avoidance/preference tests, fish/daphnia, 34-45, 35, 36(illus), 38-41(tables)
- Benthic invertebrates
 - in rocky-bottomed streams, 134-153
 - sampling methods, 136-147, 138(table)
- Benzo(a)pyrene
 - partitioning of, in sediment, 322(table)
- Bioaccumulation
 - 1,2,4-trichlorobenzene
 - spot fish, 261-269, 264(table)
 - ASTM Standard E 1022-84: 263
 - chlorinated hydrocarbons
 - amphipods, 321-327, 323(table)
 - mexacarbate
 - crayfish, 273, 275-277, 278(tables), 281-285
- Bioactivation
 - for Frog Embryo Teratogenesis Assay (FETAX), 54-55
- Bioassays (See also Mesocosms; Microcosms)
 - behavioral
 - daphnia, 34-45, 36(illus), 41(table)
 - fish, 34-45, 35(illus), 39, 40(tables), 271, 281
 - DNA replication, 47-48, 50, 55-56
 - Fish Acute Toxicity Syndrome (FATS), 55-56, 63(table), 63-68, 107
 - Frog Embryo Teratogenesis Assay (FETAX), 46-47, 53-56
 - immunological techniques, 427-431

Bioassays (cont.)

laboratory certification programs, 243-250

laser/microbe, 95-103

oocyte expression assay, 47, 49, 55-56

standards for, 243-250

manual, 247

test organisms, 247(table)

toxicity of effluents, 243-250

Biodegradation

by clam enzymes, 74-81, 77(table)

by organophosphate acid anhydases, 74-81

by protozoan enzymes, 74-81, 77(table)

Body weight depression

mexacarbate toxicity

crayfish, 272, 273(table), 280, 280(table)

C**Cadmium**

toxic effects

estuarine organisms, 82-93, 91(table)

marine organisms, 91(table)

sheepshead minnows, 404, 405-408, 407(table)

uptake by mud crab, 84-85, 87-89

uptake by protozoa, 84-85, 87-89

Cages

use in estuarine ecosystem studies, 123, 129

Calcium carbonate

uptake by mysids, 402-411

effect on growth/reproduction, 402-411, 406, 410(tables)

Champia parvula

rapid-chronic toxicity tests, 253, 255-260, 256, 257(tables)

Chemical analysis methods

international standards, 5-10

Chemical fingerprint

in laser/microbe bioassay, 96-97, 100

Chemical residues

in farm pond studies, 115-116

Chemicals (See also Organic chemicals)

premanufacture notice (PMN)

tier testing, 205-208

Chironomidae

culture of, 392-400

Chlorinated hydrocarbons

toxic effects

amphipods, 315-327, 320(table)

Chlorpyrifos

field vs laboratory testing, 200-202, 201(table)

Mixed Flask Culture, 200-202

Standardized Aquatic Microcosm, 200-202

Chromium, hexavalent

acute toxicity tests, 254-255, 257(table)

maximum allowable toxicant

concentrations (MATCs), 337, 348, 349, 351, 352, 360(tables)

rapid-chronic toxicity tests, 251-260, 256-258(table), 349-354, 350(table), 356, 359, 360-361(tables)

Chronic endpoints

for rapid-chronic toxicity tests

hexavalent chromium, 340(table), 342

pentachlorophenol, 340(table), 342

Cladocerans (*See Daphnia magna; Daphnia pulex*)

Clams

enzymatic biodegradation

organophosphate acid anhydases, 76-81, 77, 79(tables)

Cobalt

use in duckweed culture, 380-391, 384, 386-390(tables)

Coefficient of variability

for fatty acid composition

brine shrimp, 413, 415-417, 418-421(tables)

in Mixed Flask Culture studies, 189-202

in Standardized Aquatic Microcosm studies, 189-202

Collaborative studies, 7-10 (*See also* Interlaboratory studies)

definition of, 8

Community studies

in estuarine ecosystems, 124, 131

Contaminants (See also Pollutants)

in estuarine ecosystems, 120-131

acute toxic effects, 121-123

chronic toxic effects, 123

transport/fate of, 121

Crab, mud

cadmium toxicity, 83-89, 88(table), 91-93

Crayfish

mexacarbate bioconcentration, 273(tables), 275-277, 278, 281-285

acute toxicity, 270-285, 273, 283(tables)

effect on behavioral patterns, 271, 281

Cross-reactivity

deconvolution technique, 22-23

immunoassays, 21-33

Cyprinodon variegatus (*See* Sheepshead minnow)

D

- Daphnia*
 biovolume calculation, 168-174, 172-173(tables), 175(illus)
 in microcosm laboratory test, 168-174, 175(illus)
- Daphnia magna*
 avoidance tests
 phenols, 36-37, 40-41, 41(table), 42(illus)
 culture in reconstituted water, 367-378, 371(table)
 reproduction, 371, 372, 374-378
- Daphnia pulex*
 culture in reconstituted water, 367-378, 371(table)
 reproduction, 371, 372, 374-378
- Data quality objective
 interagency studies, 13
- Days-weighted-by-variable(DWV) statistic, 168-170, 172-173(tables)
- Demography
 tubicolous amphipod, 298-300, 299(table), 302, 302(table)
- Detoxification systems, biological
 evolution of, 80-81
- DFPases, 74-81
- Diatoms
 chronic estimation toxicity tests, 345-354, 350, 351, 352(tables)
- Dietary accumulation (*See also* Bioaccumulation 1,2,4-trichlorobenzene)
 spot fish, 261-269, 264(table)
- Differential light scattering
 in bacteria counting, 96-100
- Dinophilus gyrociliatus*
 rapid-chronic toxicity tests, 254, 255-260, 257, 258(tables)
- DNA
 replication
 frog DNA assays, 47-48, 50, 55-56
 synthesis
 inhibitors of, 48, 49, 50, 55-56
- Documentation
 for interlaboratory studies, 18
- Duckweed
 culturing/testing of, 379-391

E

- Ecosystem-level endpoints
 measurement with aquatic microcosms, 209-212, 211(table)
- Ecotoxicology

- definition of, 204
 estuarine ecosystems, 120-131
 experimental design, 125-126
- Effluents
 toxicity bioassays
 regulation of, 243-250
- Enclosures, experimental
 cages
 estuarine studies, 123, 129
 farm pond studies, 113-119
- Endpoints
 ecosystem, 209-212, 211(table)
 rapid-chronic tests
 hexavalent chromium, 340(table), 342
 pentachlorophenol, 340(table), 342
- Environmental impact assessment
 microcosm testing, 215-218, 224-238
 microorganisms, 224-238
- Environmental monitor
 laser/microbe bioassay, 95-103
- Environmental Protection Agency
 ecotoxicology testing and, 205-207
 field testing recommendations, 137
 regulatory responsibilities, 205
 sampling methods, 137, 138(table)
 tier testing, 205-207, 213-214
- Environmental regulations
 state level, 243-250
 toxicity bioassays, wastewater, 243-250
- Enzymes
 biodegradation activity, 75-76
 clam, 74-81, 77, 79(tables)
 hog kidney, 74-81, 77, 79(tables)
 Mazur-type, 74-81, 77, 79(tables)
 for organophosphate substrates, 74-81, 77, 79(tables)
 protozoa, 74-81, 77, 79(tables)
 squid-type, 74-81, 79(table)
- EPA (*See* Environmental Protection Agency)
- Errors, statistical
 "outliers", 9-10
 random, 6
 sampling, 6-7
 avoidance of, 17-18
 systematic, 6
- Esters
 quantitative structure-activity relationships (QSARs), 60
- Estuarine ecosystems
 contaminant assessment, 120-131
 review, 122(table)

F

- Farm pond studies

Farm pond studies (*cont.*)

- future of, 118-119
 - history of, 113-119
 - pyrethroids, 113-119
 - study objectives, 114
- Fathead minnow
- avoidance tests
 - phenol, 36(illus), 38-40, 40(table)
 - polar/nonpolar narcosis, 60-62, 61, 62(tables)

FATS (*See* Fish Acute Toxicity Syndrome)

Fatty acids

- in brine shrimp, 413-422, 416, 418-421(tables)
- nutritional variability, 413-414, 422

FDA (*See* Food and Drug Administration)

Feeding regime

- daphnid culture, 368-369

Ferguson's rule

- anesthetics, properties of, 69-70

FETAX [*See* Frog Embryo Teratogenesis Assay (FETAX)]

Field testing

- EPA recommendations, 137
- estuarine ecosystems, 120-131
- farm pond studies, 113-119
- history of, 113-119
- on-site auditing, 14
- in regulatory agency decision-making, 208-212
- streams, rocky-bottomed, 134-153
- types of, 138(table)
 - community survey, 124, 131
 - comparative evaluations, 136-139
 - population survey, 136-139
 - reconnaissance survey, 136-139
- validation of field data, 121
- vs laboratory testing, 121, 190, 200-201, 201(table)

Fish (*See* Fathead minnows; Rainbow trout; Salmon; Sheepshead minnows; Spot; Steelhead; Striped bass)

Fish Acute Toxicity Syndrome (FATS), 63(table), 63-68, 107

Fluorene

- field vs laboratory tests, 200-202, 201(table)
- Mixed Flask Culture, 200-202
- Standard Aquatic Microcosm, 200-202

Food and Drug Administration (FDA)

- ecotoxicology testing and, 207-208
- regulatory responsibilities, 205

Frog Embryo Teratogenesis Assay (FETAX), 47, 48-49, 50(table), 53-54

G

Genetically engineered microorganisms (GEM)

- ecosystem-level impact evaluation, 215-218, 219(table)

Mixed Flask Culture, 224-225, 236-238

Growth medium

Hoagland's

- for duckweed culture, 381(table), 386-389(tables)

- for mysid culture, 402-411, 410(table)

Grubbs test, 9

H

Hazard assessment

- pesticide contamination
 - estuarine ecosystems, 131
- regulatory decision-making, 204-220
- testing scheme for, 214, 215(illus), 215-219

toxic chemical ranking

- in aquatic microcosms, 182-187, 185(table)

- in laboratory vs field tests, 190

- use of teratogenesis assays, 46-58

Hog kidney enzymes

- biodegradation, 74-81, 79(table)

Hydrocarbons, chlorinated

toxic effects

- amphipods, 315-327, 320(table)

I

Immunoassays

- cross-reactivity of chemicals, 21-33
- selected references, 427-431

Interagency harmonization, 1, 11-18

Interlaboratory studies

- chemical analysis, 5-10
- fatty acid composition
 - brine shrimp, 413-422, 416, 418-421(tables)

methods of analysis

quality control, 15

- performance evaluation, 14-16

- vs single laboratory studies, 8-10

International standards

- chemical analysis methods, 5-10

International Union of Pure and Applied Chemistry (IUPAC), 8.9

Intervals of nonsignificant difference, 161-166

Invertebrates, benthic (*See* Benthic invertebrates)

Iotic ecosystems
benthic invertebrates in, 134-153, 138(table)
sampling methods, 136-147

L

Laboratories
regulation of, 244-250
state certification, 245(table)
Laboratory studies
chemical analysis methods, 5-10
quality control, 15
single laboratory vs interlaboratory studies, 8-10

Larvae
grass shrimp
and cadmium toxicity, 83-89, 88(table), 91-93
mud crab
and cadmium toxicity, 83-89, 88(table), 91-93

Laser biotechnology
use in laser/microbe bioassay system, 94-103

LC₅₀
chlorinated hydrocarbons
amphipods, 320-321
mexacarbate
crayfish, 277-279
statistical methods, 246

Leiostomus xanthurus
bioaccumulation
1,2,4-trichlorobenzene, 261-269

Lemna gibba
culturing/testing of, 379-391

Lemna minor
culturing/testing of, 379-391

Limits of detectable change
microcosm studies, 181-182
Mixed Flask Culture, 192-193, 196, 198-202, 199(illus)
Standard Aquatic Microcosm, 196, 198-202

Littoral corrals, 119

LT₅₀
chlorinated hydrocarbons
amphipods, 320-321, 322
mexacarbate
crayfish, 281

M

Macroinvertebrates
in rocky-bottomed streams, 134-153, 138(table)
sampling methods, 136-147
Maximum allowable toxicant concentration (MATC)
for hexavalent chromium, 337, 340, 349, 351, 352, 359, 360(tables)
for pentachlorophenol, 337, 340, 350, 351, 352, 359-360, 361(tables)

Mazur-type enzymes
biodegradation, 74-81, 79(table)

Mesocosms
for study of pyrethroid toxicity, 118-119

Metabolic products
mexacarbate
crayfish, 275(table), 283

Metals, trace (*See* Trace elements)

Mexacarbate
crayfish
acute toxicity, 271-276
bioconcentration, 273, 275-277, 278(tables), 281-285

MFC (*See* Mixed Flask Culture)

Microbial assay
using laser beams, 94-103

Microbial pest control
Bacillus thuringiensis, 225-226, 230-238
of mosquitoes, 225-226, 230-238

Microcosms (*See also* Standardized Aquatic Microcosm)

Bacillus thuringiensis culture, 224-238
ecosystem endpoints, 209-212, 211(table)
oxygen production, 180-187, 191-202
statistical properties, 178-187, 189-202
precision/accuracy of, 189-202
replicability of, 193-196
testing for regulatory decisions, 204-220
objectives of, 212-220

Microorganisms [*See also* *Bacillus subtilis*; *Bacillus thuringiensis*; Genetically engineered microorganisms (GEM)]
microcosm culture, 226-228

Midges
culture of
effect of diet, 392-400, 396-399(tables)
microbial control of, 224-238

Minnows (*See* Fathead minnows; Sheepshead minnows)

Mipatox, 77

Mixed Flask Culture (MFC)
Bacillus thuringiensis, 225-226, 266
ecosystem-level endpoints, 211(tables)

Mixed Flask Culture (cont.)

precision/accuracy of data, 189-202

replicability of data, 193-196

Monitoring

laser/microbe bioassay system, 94-103

Morone saxatilis

avoidance/preference tests

sewage, 34-45, 35(illus), 38, 39(tables)

Mosquitoes

microbial control of, 224-238

Mud crab

cadmium toxicity, 83-89, 88(table), 91-93

Multispecies tests (See also Mesocosms;

Microcosms; Standard Aquatic

Microcosm)

ecosystem endpoints, 208-212, 211(table)

Mysidopsis bahia

acute toxicity tests, 254-255, 257(tables)

404, 405-408, 407(tables), 410, 411

cadmium toxicity effects, 404, 405-408,

407(tables), 410, 411

calcium carbonate requirements, 402-411,

406, 410(tables)

in estuarine ecosystems, 126-130

rapid-chronic toxicity tests, 254, 255-266,

257, 258(tables), 333-343, 338-

339(tables)

N**Narcosis, aquatic organisms**

nonpolar, 60, 69-71, 104-108

definition of, 105-106

mode of action, 106

site of action, 106

in vivo signs, 107

polar, 59, 69-71

definition of, 59

mechanism of, 59

National Pollutant Discharge Elimination System (NPDES), 243**New Jersey**

toxicity test laboratory certification, 243-250

Nitrates

in microcosm study, 170-174, 176(illus)

NPDES [See National Pollutant Discharge Elimination System (NPDES)]**Nutrition**

fatty acid variability

brine shrimp, 413-414, 422

trace elements

daphnid culture, 367-368

duckweed culture, 379-391

midge culture, 392-400

mysid culture, 402-411

O**Oil refinery waste**

avoidance/preference tests

fish, 38, 39(table), 43

Olfactory stimulants

avoidance/preference tests

fish, 39, 40(table)

Oncorhynchus tshawytscha

avoidance/preference tests, 34-45,

35(illus), 38, 39, 40(tables)

Oocyte Expression Assay, 47, 49, 55-56**OPA anhydrases, 74-81*****Orconetes limosus***

bioconcentration

mexacarbate, 273(tables), 275-277, 278,

281-285

Organic chemicals (See Anilenes; Atrazine;

Benzo(a)pyrene; Chlorinated

hydrocarbons; Chlorpyrifos; Esters;

Mexacarbate; Organophosphates;

Pentachlorophenol; Phenols;

Pyrethroids; Sodium

pentachlorophenate; 2,2',4,4'-

Tetrachlorobiphenyl; 1,2,4-

Trichlorobenzene)

Organophosphate acid anhydrases, 74-81**Organophosphates**

biodegradation of, 74-81

Overview of aquatic toxicology, 1**Oxygen production**

in Mixed Flask Culture, 191-202, 226-227

in pollutant-treated microcosms, 180-187, 191-202

P***Palaemonetes pugio* (See Shrimp, grass)****Partitioning**

in sediment

benzo(a)pyrene, 322(table)

mixed chlorinated hydrocarbons,

317(table), 318

2,2',4,4'-tetrachlorobiphenyl, 322(table)

Penaeus dourarum

in estuarine ecosystems, 126-130,

128(table)

Pentachlorophenol

chronic estimation toxicity test, 337-342, 339(table), 350-354, 351(table), 359-360

MATCs, 337, 340(table), 350, 351,

352(table), 359-360, 360-361(tables)

as reference toxicant, 333-343, 355-363

Performance evaluation

- interlaboratory studies, 14–16
- standardization, 17–18
- Performance parameters
 - collaborative studies, 7–8, 9
- Pest control, microbial
 - Bacillus thuriangiensis*, 225–238
 - of mosquitoes, 225–226, 230–238
- Pesticides
 - aquatic field studies, 113
 - estuaries, 126–130
 - farm pond studies, 113–119
 - pyrethroids, 113–119
 - mixed flask culture/Standardized Aquatic Microcosm
 - chlorpyrifos, 200–202, 201(table)
- Pharmacokinetics
 - 1,2,4-trichlorobenzene
 - in spot, 266–269, 268(table)
- Phenols (*See also* Pentachlorophenol)
 - avoidance tests, 36–37, 38–41
 - daphnia, 38–41, 41(table)
 - fathead minnow, 38–41, 40(table)
 - fish acute toxicity syndrome, 63(table), 63–68
 - polar narcosis, fish, 61, 62(tables)
- Pimephales promelas* (*See* Fathead minnow)
- Plants, aquatic
 - culturing/testing of duckweed, 370–391
- Polar narcosis (*See* Narcosis, aquatic organisms)
- Pollutants (*See also* Contaminants)
 - in estuarine ecosystems, 120–131
 - in rocky-bottomed streams, 147–153
- Polychaetes
 - rapid-chronic toxicity tests, 254, 255–260, 257, 258(tables)
- Pontoporeia hoyi* (*See* Amphipods)
- Population studies
 - in estuarine ecosystems, 124, 131
 - in rocky-bottomed streams, 136–139
- Proficiency studies
 - definition of, 8
- Protozoa
 - enzymatic biodegradation, 76–81, 77, 79(tables)
- Pyrethroids
 - aquatic field studies, 113–119
 - farm pond studies, 113–119

Q

- QSARs (*See* Quantitative structure-activity relationships)
- Quality assurance
 - test data, 11–18
 - data quality objectives, 13

- data review, 14
- documentaion and data
 - communications, 18
 - management of, 13
 - method validation and equivalency, 16–17
 - on-site auditing, 14
 - performance evaluation, 14–16
 - sample management, 17
 - statistics and chemometrics, 17
 - toxicity bioassay data, 244
 - wastewater testing, 244
- Quality control
 - chemical methods of analysis, 10, 12
 - intralaboratory, 15
 - toxicity bioassays, 246–247
 - manual for, 247
- Quantitative structure-activity relationships (QSARs)
 - anilenes, 60–62, 71
 - esters, 60–62, 71
 - narcotic chemicals, 104–105, 107
 - phenols, 60–62, 71

R

- Rainbow trout
 - fish acute toxicity test, 63(table), 63–68, 107
- Random error, 6
- Rangia cuneata*
 - enzymatic biodegradation
 - organophosphate acid anhydases, 76–81, 77, 79(tables)
- Rate of uptake
 - cadmium
 - mud crab, 84–85, 87–89
 - protozoa, 84–85, 87–89
 - mexacarbate
 - crayfish, 281–283, 283(table)
- Reconstituted water (RCW)
 - for daphnid culture, 367–378
 - for midge culture, 367–368, 393
 - presence of trace elements, 367–368
- Reference materials
 - immunoassays, 427–431
 - for interlaboratory studies, 14, 16
- Reference toxicants
 - rapid-chronic toxicity tests
 - hexavalent chromium, 251–260, 333–343, 355–363
 - pentachlorophenolate, 333–343, 355–363
- Regulatory agencies (*See also* Environmental Protection Agency; Food and Drug Administration)
 - cooperation between, 1, 11–18

- Regulatory agency (*cont.*)
 ecotoxicity testing for, 204–220
 use of microcosm test data, 204–220
- Replication assays
 frog DNA, 47–48, 50, 55–56
- Reproduction
 chronic estimation toxicity, 342
 daphnia
 in reconstituted water, 371, 372, 376–378
 midges
 effect of diet, 395–400, 396–399(tables)
 mysids
 effect of calcium carbonate concentration, 402–411, 406, 410(tables)
 effect of chromium, 337–343, 338, 339, 340(tables)
 effect of sodium pentachlorophenate, 337–343, 338, 339, 340(tables)
 tubiculous amphipods, 300–303, 301, 302(tables)
- Response curve
 oxygen production in pollutant-treated microcosms, 185–187
- Rhithropanopeus harrisii*
 cadmium toxicity, 83–89, 88(table), 91–93
- Risk assessment (*See* Hazard assessment)
- S**
- Salmo gairdneri*
 avoidance/preference tests, 34–45, 35(illus), 38, 39, 40(tables), 63(table), 63–68
 fish acute toxicity syndrome, 107
- Salmon
 avoidance/preference tests
 olfactory response, 34–45, 38, 40(table)
- SAM (*See* Standardized Aquatic Microcosm)
- Sampling
 errors of, 6–7
 avoidance, 17–18
 methods
 streams, rocky-bottomed, 136–147, 138, 151(tables)
 sediments, 290–306
 standards for, 246(table)
- San Francisco Bay, 307(illus)
 dredged sediments
 chronic toxicity tests, 304–313, 310, 312(tables)
- Sea urchin
 rapid-chronic toxicity tests, 252–253, 255–260, 257(table)

- Sediments, contaminated
 chronic toxicity tests
 amphipods, 289–303, 295, 297(tables), 304–313, 310, 312(tables), 315–327, 320(table)
 sampling of, 290–293, 306
- Selenium
 in culture of daphnids, 369–370
 in culture of duckweed, 380–391, 382–383(tables), 386–390(tables)
- Sheepshead minnow
 acute toxicity tests, 254–255, 257(table)
 rapid-chronic toxicity tests, 253, 255–260, 256, 257, 258(tables), 355–363, 360, 361(tables)
- Shrimp
 brine
 fatty acid composition of, 413–422, 416, 418–421(tables)
 nutritional variability, 413–414, 422
 grass
 cadmium toxicity, 83–89, 88(table), 91–93
 in estuarine ecosystems, 83–89, 88(table), 91–93, 126–130, 128(table)
- Simulations
 of immunoassays, 27–33
- Skeletonemia costatum*
 chronic estimation toxicity tests, 345–354, 350, 351, 352(tables)
- Sodium pentachlorophenate
 chronic toxicity test, 333–343, 355–363, 359, 360–361(tables)
 MATCs, 340(table), 359–360, 360–361(tables)
 as reference toxicant, 355–363
- Spot
 bioaccumulation, 1,2,4-trichlorobenzene, 261–269, 264, 268(tables)
- Squid enzymes
 biodegradation, 74–81, 79(table)
- Standard operating procedures
 toxicity bioassay laboratories, 246–247
 manual, 247
- Standardization
 bioassays of water, 243–250
 chemical analytical methods
 international, 5–10
 of documentation and data
 communication, 18
 role of ASTM, 12
- Standardized Aquatic Microcosm (*See also* Microcosms)
 ecosystem-level endpoints, 211(table)
 history of, 209
 precision/accuracy of, 189–202

- and regulatory decision-making, 204-220
- replicability of, 193-196
- statistical properties, 159-176
- Statistical analysis [*See also* Analysis of variance (ANOVA); Coefficient of variability; Intervals of nonsignificant difference; Limits of detectable change]
 - detection limits, 17
 - errors of, 7-10
 - Grubbs test, 9
 - interlaboratory studies, 8-10, 13-18
 - modeling
 - immunoassays, 23-33
 - "outliers", 9-10
 - pollutant-induced changes in microcosms, 178-187, 192-193
 - problems in ecological monitoring, 159-160
 - replicability, 193-196
- Statistical properties
 - microcosms, 178-187
- Mixed Flask Culture, 189-202, 229
- Standardized Aquatic Microcosm, 159-176, 189-202
- Steelhead
 - avoidance/preference tests
 - oil refinery waste, 34-45, 35(illus), 38, 39(table)
 - sewage, 34-45, 35(illus), 38, 39(tables)
 - fish acute toxicity syndrome, 63(table), 63-68
- Streams, rocky-bottomed
 - benthic macroinvertebrates, 134-153, 138(table)
 - sampling methods, 136-147
- Stress
 - ecosystem response, 210(table)
- Striped bass
 - avoidance/preference tests
 - sewage, 34-45, 35(illus), 38, 39(tables)
- Survival
 - midges, effect of diet, 395-400, 396-398(tables)
- Systematic error, 6

T

- Tanytarsus dissimilis*
 - effect of various diets, 392-400
- Teratogenicity
 - assay
 - frog embryo (FETAX), 46, 53-54
 - mechanisms, 46-58
- 2,2',4,4'-Tetrachlorobiphenyl
 - partitioning of, in sediment, 322(table)
- Tetrahymena thermophila*
 - enzymatic biodegradation, 76-81, 77, 79(tables)
- Tier testing
 - microcosm testing, 213-214
 - use by EPA, 205-207
 - use by FDA, 207-208
- Tin
 - duckweed culture, 380-391, 385, 386-390(tables)
- Toxicity tests (*See also* Bioassays)
 - acute
 - cadmium, 404, 405-408, 407, 410(tables)
 - hexavalent chromium, 251-260
 - mexacarbate, 270-285, 273, 283(tables)
 - chronic
 - contaminated sediments, 289-303, 295, 296-297(tables), 304-313, 310, 312(tables), 315-327, 320(table)
 - hexavalent chromium, 251-260, 333-343, 345-354, 355-363, 360(table)
 - pentachlorophenolate, 333-343, 338-339(tables), 345-354, 355-363, 360, 361(tables)
 - manual for standards, 247
 - methods of analysis
 - accuracy, 6-10, 16-17
 - equivalency, 16-17
 - harmonization of, 8-10
 - precision of, 6-10, 16-17
 - quality control, 10, 12
 - standards for, 243-250
 - validation of, 16-17
 - tier testing, 205-208, 213-214
- TOXSTAT
 - statistical program, 358
- Trace elements
 - in daphnid culture, 367-378
 - in duckweed culture, 379-391
 - in reconstituted water, 367-368
 - role in metabolism, 373-374
- Transportability of data, 12
 - data quality, 13
- 1,2,4-Trichlorobenzene
 - bioaccumulation, fish, 261-269, 264(table)
 - pharmacokinetics, fish, 266-269, 268(table)
- Tubicolous amphipod
 - chronic toxicity tests
 - dredged sediments, 289-303, 295, 296, 297(tables), 304-313, 310, 312(tables)
 - description of, 305

V

Vanadium

duckweed culture, 380-391, 382-383(tables), 386-390(tables)

Video-computer system

for avoidance/preference tests, 37

W

Waste

oil refinery

avoidance/preference tests, fish, 38, 39(table), 43

Water, reconstituted (See Reconstituted water)

Water analysis

laser/microbe bioassay system, 95-103
state regulation of, 243-250

X

***Xenopus* embryos**

in teratogenesis assays, 46, 50, 53-54

Z

Zinc

in daphnia culture, 370

effect on reproduction, 372

uptake by grass shrimp larvae, 89-91, 92-93

uptake by mud crab larvae, 89-91, 92-93