

Subject Index

Note: page numbers in *italic* refer to tables or figures.

- Acinebacter* sp. 21, 53–4
acyl-CoA in synthesis 11, 12, 13
African grasslands 24, 26
alcohol ethoxylates 41–7, 51, 64
 analysis 67–8
 structure 43
 world production 46–9, 51
alcohol sulfates 41, 43
Aleurodicus dugesi 30
algae 22, 23, 54, 111
alkanes
 metabolic degradation 52–4
 paraffin production 36, 37
alkenes 36–41
alkylbenzene sulfonates 48–9
Anabaena cylindrical 23
analytical methods 67–73
 environmental/sedimentary samples
 69–71
 free fatty alcohols and ethoxylates
 67–8
 inter-laboratory comparisons 71
animals 10, 20–1, 110–13
 birds 21, 30–1
 desaturation of acyl chain 13
 fatty acid/alcohol synthesis 16–18
 marine fauna 25–8, 114–15
anteiso compounds 1, 2
 and bacteria 21, 22, 114
Ascophyllum nodosum 24
Atlantic 88–9, 90, 92
bacteria 9, 10, 31
 biomarkers 110, 112–14
 fatty alcohols from 21, 22
 metabolic degradation of alcohols
 52–4
 Type II fatty acid synthesis 14
Beilstein Chemical Database 6
Bemisia tabaci 29
biofuels 50–1
biological synthesis *see* biosynthesis
biomarkers 20, 110
 bacterial biomass 112–14
 marine fauna 114–15
 photosynthetic activity 115–16
 stable isotopes 110–12
 terrestrial plants 115
biosynthesis 10, 19
 fatty alcohol/wax production 15–17, 19
 from carbohydrates 18–20
 Type I fatty acid synthesis 10–13
 Type II fatty acid synthesis 14–19
biota, fatty alcohols in 20–31
birds 21, 30–1
bis(trimethylsilyl)trifluoroacetamide 70
Blackpool Beach 117–19, 120, 126
Bolton Fell Moss 105–6
Botrytis cinerea 54
branched chain alcohols 1, 2
 and bacteria 21, 112, 114, 116
 biosynthesis 15
 from petrochemicals 37, 38, 51

- Calanus finmarchicus* 28
 carbohydrate precursors 18–20
 carbon capture 49
 carbon isotopes 110–11, 116
 carbon preference index 113–14
 chain length 1
 as biomarker 110, 114–15, 116
 bird preen gland 31
 degradation rate 55
 detergent alcohols 42, 43, 51
 insects 30
 marine animals 29, 114–15
 odd vs even carbon number 110, 112–13
 and partition coefficient 7
 and physiochemical properties 130
 plants 25, 26, 27, 28, 115
 sewage treatment plants 46, 47
 and solubility 3, 4, 5, 6, 9
 and toxicity 133–4
Chlorella kessleri 23
 chlorophyll 3, 21–3, 115, 116
 chromatography 67, 70, 72
 Clyde Sea 102–4, 113–14
 coconut oil 13, 14, 33, 34
 Concepción Bay 79–82
 consumer products 32–3, 51
 health and safety 132–6, 141
 continental slope 92–4
 Conwy Estuary 97–9
 copepods 18–19, 22, 27, 28
- Daphnia magna* 138–9
 degradation, environmental *see*
 environmental transformations
 dermal exposure 133–4, 135
 desaturation 12, 13, 14
 detergents/detergent alcohols 32–3
 detergent formulations 41, 43, 44–5
 future of production 50, 51
 manufacture
 oleochemical-based 33–6
 petrochemical-based 36–41
 and wastewater treatment 42, 46–7, 64, 65
 world production/usage 46, 51
- Japan 47–8
 North America 49–51
 Western Europe 48–9
 deuterium 110–11, 116
 diols 2, 3, 23
- E. coli* 51
 East China Sea 94–5
 Eastern North Atlantic 88–9, 90
 environmental safety 128, 141
 environmental effects 136–9
 measurement of exposure 139–40
 OECD SIAR summary 128–32
 pathways of exposure 136
 risk characterisation 140–1
 see also human safety
 environmental sources 65–6
 occurrence in biota 20–31
 see also environmental studies
 environmental studies 75–6, 76, 77, 78
 concentrations compared 109
 freshwater
 Loch Lochy (UK) 106–9
 Lochnagar (UK) 106
 Looe Pool (UK) 105
 marine
 Blackpool Beach (UK) 117–19, 120, 122, 126
 Clyde Sea (UK) 102–4, 113–14
 Concepción Bay (Chile) 79–82
 Continental Slope (SW of Taiwan) 92–4
 Conwy Estuary (UK) 97–9
 East China Sea (NW of Taiwan) 94–5
 Eastern North Atlantic 88–9, 90
 Falkland Plateau (South Atlantic) 92
 Guatemalan Basin (Central America) 92, 93
 Loch Eil (UK) 106–9
 Loch Riddon (UK) 55–8, 61–2, 101–2, 119–21
 Mawddach Estuary (UK) 99, 100, 101
 Menai Straight (UK) 99–101

- Ria Formosa lagoon (Portugal)
83–8, 123, 124, 126–7
- Rio de Janeiro (Brazil) 82–3
- Rio Grande Rise (Brazil) 89–92
- San Miguel Gap (California) 89, 91
- San Vicente Bay (Chile) 79–82
- Victoria Harbour (Canada) 76–9
- terrestrial
- Bolton Fell Moss (UK) 105–6
 - Pasture Land (Southern Australia)
95
 - Prairie Zone Soils (Canada) 95–6
- environmental transformations 15
- degradation rate constants 56, 60–2, 66
 - metabolic pathways 52–4
 - natural degradation 55
 - long chain moieties 59–60
 - short chain moieties 55–9
 - sewage treatment plants 63–6
 - sources of fatty alcohols 65–6
- ethene *see* ethylene
- ethoxylates *see* alcohol ethoxylates
- ethylene
- oligomerisation/SHOP process 39, 40
 - Ziegler growth process 38, 39
- exposure model 132
- extraction protocols 69–70
- Falkland Plateau 92
- fat/oil sources 13, 34
- fatty acid acyl-Co reductase 15–18
- fatty acid methyl ester 35–6
- fatty acids
- and bacteria 21, 22
 - degradation *see* environmental transformations
 - hydrogenation 36
 - hydrolysis of triglycerides 35
 - microbial production 51
 - oil/fat sources 13, 34
 - Type I synthesis 10–13
 - Type II synthesis 14–19, 21
 - fatty acyl-CoA reductase 15–18
- fatty alcohols, defined and introduced 1–9
- Fischer–Tropsch process 40–1, 42
- 2-fluoro-*N*-methylpyridium *p*-toluenesulphonate 67–8
- freshwater environments *see* Loch Lochy; Lochnager; Looe Pool
- Fucus spiralis* 24
- Gracilaria folifera* 24
- Guatemalan Basin 92, 93
- health and safety *see* environmental safety; human health and safety
- human health and safety
- consumer products and uses 132–3
 - exposure characteristics 134
 - hazards 133–4
 - risk characterisation 134–6
- hydrogen isotopes 110–11, 116
- hydrogenation 36
- hydrolysis 35
- hydrophobic/hydrophilic properties 6
- industrial uses 32–3
- future production 49, 51
- insects 21, 28–30, 31
- internal olefins 36–7
- conversion to OXO alcohols 37, 38
 - and SHOP process 40, 41
- Isle of Bute 113
- iso* compounds 1, 2, 21, 22, 114
- ISOSIV process 36
- isotopic ratios 110–12
- Jatropha curcas* 49
- K_d 8
- K_{ow} 6–8
- linear alkylbenzene sulfonates 48–9
- linolenic acid 14
- linseed oil 14
- Loch Eil 106–9
- Loch Lochy 106–9
- Loch Riddon 55–8, 61–2, 101–2
- principal component analysis 119–21
- Lochnagar 106
- Looe Pool 105

- mammals 17, 133
- manufacture of alcohols *see under*
detergents/detergent alcohols
- margin of exposure 134–5
- marine flora and fauna 20, 21, 22, 29, 31
- biomarkers 110, 111, 114–15
- fatty acid/alcohol synthesis 10, 14–19
- fatty alcohol occurrence
- animals 25–8
- plants 23–4
- mass spectrometry 67–8, 70–1, 73
- Mawddach Estuary 99, 100, 101
- Menai Straight 99–101
- metabolic degradation 52–4
- in mammals 17, 133
- MOLEX process 36
- mosses 25, 27, 28
- Bolton Fell Moss study 105–6
- multivariate statistics 117
- partial least squares 123–7
- principal component analysis 117–23, 127
- Mycobacterium* sp. 21
- Nannochloropsis* sp. 23, 54
- nomenclature 1–5
- octanol-water partition coefficient 6–8, 131
- OECD SIAR 128–32
- oil/fat sources 13, 34
- olefins 36–41
- oleochemical fatty alcohols 34–6, 37, 42
- OLEX process 36, 38
- β-oxidation pathway 52–3, 66, 133
- OXO alcohols 37, 38
- modified processes 39–41, 42
- Pacific Ocean 59–60
- PACOL process 36, 38
- palm oil 13, 14, 33, 34
- palmitic acid 10, 12
- paraffins *see* alkanes
- partial least squares 123–7
- particulate matter *see* sediments
- partition 3, 9
- coefficient 6–8, 131
- pasture 95
- peat-forming plants 25, 27, 28
- Bolton Fell Moss study 105–6
- Pee Dee Belemnite 110–11
- petrochemical-based alcohols 36–41
- Phaeocystis* sp. 27
- photosynthesis 110, 115
- physiochemical properties 3–6, 9
- OECD SIAR overview 129–32
- phytol 3, 110, 115, 116
- degradation 62
- occurrence and sources 21–3
- plants *see* marine flora and fauna;
terrestrial plants
- polyethoxylates *see* alcohol ethoxylates
- prairie 95–6
- principal component analysis 117–23, 127
- production of alcohols *see under*
detergents/detergent alcohols
- products *see* consumer products
- properties *see* physiochemical
properties
- Pseudocalanus elongatus* 28
- Pseudomonas oleovorans* 53
- rate constants, degradation 56, 60–2, 66
- Ria Formosa lagoon 58, 59, 83–8, 115
- statistical analysis 124, 126–7
- Rio de Janeiro 82–3
- Rio Grande Rise 89–92
- risk
- environmental 136–41
- human health 134–6, 141
- risk characterisation ratio 140
- safety *see* environmental safety;
human health and safety
- San Miguel Gap 89, 91
- San Vicente Bay 79–82
- saponification 69–70, 73
- scrub weed 49
- sea lochs *see* Clyde Sea; Loch Eil;
Loch Riddon

- secondary alcohols 2, 3
- sediments 1
 - analytic techniques 69–71
 - sediment associations 6–8, 9
- sewage treatment plants 8, 75
 - and detergent formulation 42, 46–7
 - fatty alcohol degradation 63–6, 66
 - potential inputs and discharges 137, 139–40
 - statistical analysis 118, 122, 123, 125
- SHOP process 39, 40
- β -sitosterol 81, 115, 121, 122
- Skeletonema costatum* 23
- solubility 3–6, 9, 131
- sources *see* environmental sources
- stable isotope analysis 110–12
- Standard Marine Ocean Water 111
- statistical methods *see* multivariate statistics
- sterols 82, 82, 83, 84
 - β -sitosterol 81, 115, 121, 122
- Streptomyces coelicolor* 21
- structure-activity relationship 137–8
- structures of fatty alcohols 1–5
- studies *see* environmental studies
- sulfates *see* alcohol sulfates
- surfactants *see* detergents
- synthesis
 - biological *see* biosynthesis
 - industrial *see under* detergents
 - fatty acid synthesis 10, 14
 - fatty alcohols in 24–5
- terrestrial studies 95–6, 105–6
- toxicity *see* environmental safety;
human health and safety
- transesterification 35
- Trialleurodes vaporariorum* 29
- triglycerides 34, 35
- trimethylsilyl ethers 70
- Type I fatty acid synthesis 10–13
- Type II fatty acid synthesis 14–19
- UK studies 97–109
- unsaturated fatty alcohols 1–2, 3
 - biosynthesis 12–13, 14–15
 - uses of fatty alcohols 32–3, 51
- Victoria Harbour 76–9
- Vischeria punctata* 23
- waste water *see* sewage treatment
- waxes
 - analysis 70, 73
 - in bacteria 21
 - biosynthesis 16–17
 - metabolic degradation 53–4
 - terrestrial plants 24–5
 - uses/functions 15–16, 20
- whitefly 28–30
- yeasts 10
- Ziegler alcohols 38, 39, 42
- zooplankton 27