

Index

- absorption 37
- acceptable level 14
- acceptable risk 15
- acid rain 63
- addition reactions 34, 77, 73, 74
- adhesives 88
- agricultural materials 22, 25, 48, 68
- alternative synthetic design 21
- amino acids 100
- amphiphilic star polymers 25
- analytical methodologies 53
- animal testing 62
- aquatic environments 62
- asymmetric hydrogen transfer 105
- atom economy 11, 33, 97
- auxiliary substances 37, 90
- availability 22

- balanced chemical equations 33
- benzene 94, 97
- Bhopal 6
- bioaccumulation 6, 14, 111, 112
- bioavailability 37, 86, 89, 90
- biocatalysis 93, 120
- biodegradability 52, 94, 112, 113
- biological feedstocks 22, 23, 24, 38, 47, 48
- biomass 22, 68, 95, 119
- biomimetic 118
- biosynthesis 93

- biosynthetic 94
- biotechnology 26, 93, 94
- bisphenol-A 102
- blocking/protecting groups 49
- blowing agents 106
- brominations 105, 106
- brominations 107
- by-products 21, 74, 77, 79

- carbon dioxide 25, 45, 64, 68, 104, 105, 106, 119
- carcinogenicity 5, 17, 36, 58, 64, 94
- catalysis 25, 26, 28, 50, 77, 81, 97, 100, 103, 104, 107, 112, 117, 118
- catalysts, alternative 27
- catalytic
 - reagents 50
 - selectivity 51
 - chemical accidents 55
 - chemospecificity 73, 77
- chlorination 97
- chlorofluorocarbons (CFCs) 39, 64, 103
- chromatography 40, 74, 83
- chronic toxicity 6, 17
- Clean Air Act 6, 17, 25, 39
- Clean Water Act 17
- coatings 91
- command and control 7
- combinatorial chemistry 119

- commodity chemicals 21
- containment 74
- continuous improvement 15
- cooling 43
- copper 99
- corn 22, 96
- correlation 37
- costs 10, 16, 31, 35
- crop failure 48
- cyanide 87, 98, 99
- cyclodextrin 107

- damage 32
- databases 18, 58, 62
- decaffeination 104
- degradation products 51
- dehydration 77
- dehydrogenation 99
- dendrimers 25
- depleting resource 45, 47, 68
- Diels–Alder 79, 80, 107
- dimethylcarbonate 101
- dioxin 4
- dipolarcycloadditions 79
- Direct environmental effects 46
- disposal 31, 33, 74, 96
- distillation 44, 74, 83
- dithianes 108
- dye 85, 89

- economic benefits 16
- economic consideration 11
- ecosystem 39
- efficiency 11, 22, 36, 73
- electrophilic aromatic substitution 76
- electrochemical 81
- electronic configurations 62
- elimination reactions 34, 72, 77
- elimination–addition reactions 76
- emissions 103
- end-of pipe 10
- end-point 37, 58
- energy 120
- Energy minimization 51
- energy requirements 42
- engineering controls 32, 35
- environmental consequences 72
- environmental disasters 5
- environmental impact 2
- enzymes 118
- expoxidations 107
- exothermic 43
- expenditures on research 31
- explosions 55
- exposure 12, 15
- exposure-liming equipment 14

- fate 12
- feedstocks 10, 11, 16, 21, 31, 45, 67, 69, 93
 - alternative 22
- fires 55
- formaldehyde 98, 99
- fossil fuels 45
- fouling 111
- fractionation 83
- free radical 105, 107
- Friedel–Crafts 109
- frontier molecular orbitals 78

- global
 - climate change 64
 - environment effects 63
 - warming 64
- glucose 94
- greenhouse effect 9, 64
- groundwater 96

- halogenated
 - aromatics 120
 - solvents 38
- handling 31
- harm 32
- hazard 15
- heating requirements 43
- heavy metals 22, 27, 47
- homogeneous 97
- hydrocarbons 39, 63
- hydroquinones 113, 114

- immobilized solvents 25, 42, 107
- indirect consequences 63
- indirect environmental effects 46
- indirect toxicity 62
- indium 107
- industrial ecology 77
- insecticide 112
- ionic liquids 25
- irreversibility 58
- isocyanates 89

- just in time techniques 55

- land-energy usage 48
- leaving groups 75, 76, 78
- legislation 18
- Lewis acids 77
- light 108
- lignocellulosic materials 22
- limitations 16, 35
- liquid oxidation reactor 103
- local environment 63
- Love Canal 5

- mechanism 87
- mechanisms of action 37, 86

- mechanistic toxicology 18
- metabolite 87
- metals 117, 188
- methyl sulfate 101
- methylation 101
- microwave energy 44
- minimizing exposure 35
- mole concept 33
- molecular recognition 113
- molecular structure 85, 86
- molecular volume 62
- molting 112
- Montreal Protocol 6
- multiphase reactors 107
- mutagenicity 36

- natural resource 68
- neurotoxicity 36
- nitration 97
- nitrile 87, 110
- non-covalent derivatization 121
- nucleophilic reagents 75
- nucleophile 75

- obstacles 16
- oil spills 47
- optimizing reaction 44
- organotin compounds 111
- oxathianes 108
- oxidation 22, 46, 83, 103, 109, 117, 118
- oxidation/reduction reactions 72, 80
- oxygen 103, 118
- oxygenation 22
- ozone 9, 37, 63, 91

- pericyclic reactions 72, 78, 79
- peroxide 118
- persistence 51, 52

- pesticides 53, 85
- petroleum 22, 45, 47, 93
- pharmaceutical industry 26
- phosgene 100, 102
- phosphates 62
- photochemical 108
- physical and chemical properties 37
- plastics 53
- political effects of petroleum 47
- Pollution Prevention Act 7
- polyacrylic 112
- polyaspartate 112
- polymers 90, 93, 102, 105, 108
- polysaccharide 93
- polyurethanes 89, 100
- potency 58
- precipitation 83
- preventative medicine 31
- process analytical chemistry 26
- product, alternative 26
- protecting groups 75
- protective
 - clothing 35
 - gear 32
- purification 44, 83

- Rachel Carson 2
- raw materials 45
- reaction conditions 21
- real-time measurement 26
- rearrangements 34, 72
- recrystallization 40, 44, 74, 83
- recycling 22, 74, 103
- redox 83
- reduced exposure 14
- reduction 104, 118
- refining 22
- regiospecificity 73, 77
- regulation 35

- releases 18, 55
- renewable 45, 48, 68, 93
- reproductive and developmental toxicity 36
- Resource Recovery and Conservation Act 17
- respirators 35
- reversibility 58, 61
- risk 14
 - analyses 12
 - reduction 16
- role of chemists 9
- ruthenium 105

- Safe Drinking Water Act 17
- seasonal supply 48
- selectivity 51
- self-assembly 113
- separation 32, 39
- separation energy 44
- severity 58, 60
- sigmatropic rearrangements 79
- Silent Spring 2
- smog 63
- SN1 75
- SN2 75
- social perspective 36
- solar power 45
- solid-state 102
- solvents 25, 38, 41, 120
 - alternative 25
- sonic 44
- special handling 32
- specificity 11
- starting materials 21, 67
- stereochemistry 51
- stereocontrol 48
- stereospecificity 77
- stoichiometric reagents 50

- stoichiometry 25, 82
- stockpiles 56
- stratospheric ozone depletion 64
- strecker synthesis 98
- structure activity relationships (SAR) 86, 88
- structure-activity models 62
- structural modifications 37
- substitution 34
- substitution reactions 72, 75
- supercritical fluids 25, 40, 104, 105
- superfund 17
- supramolecular 113
- sustainability 46, 68
- synthetic
 - chemists 9
 - pathway 21
 - design, alternatives 21

- tetrahydrofuran 108
- thalidomide 3
- thermal energy 43
- Times Beach 4
- toxic effect 37
- toxic release inventory 2
- toxicity 26, 87, 93
 - data 14
 - to other species 58

- toxicological data 19
- transition metals 97, 103, 118
- transport 90
- transport data 12
- treatment 31, 32
- Twelve Principles 29, 30
- type of reaction 72
- type of transformation 72

- ultrafiltration 44
- unsaturation 77

- vinyl sulfone 89
- visible light 22
- volatile organic compounds 90

- waste 31
 - systems 8, 28
 - treatment 18
- water 106
- wildlife 61, 85
- Wittig reaction 33

- Yield 33