

Index

a

abrasion to printing cylinder 149
 absorption constant 57
 – of light 57f.
 ABS polymers 175
 accelerated light- and weatherfastness exposure
 equipment 95ff.
 acetoacetic arylides 200
 acetolone, 5-
 acetoacetylaminobenzimidazolone 373
 acid number of pigments 63
 acidic ring closure 462
 acute toxicity 693
 agglomerates
 – definition 21
 – dispersion 78ff., 133f., 146f.
 – spin dyeing 181ff.
 aggregates 21, 27
 agitated ball mills 147
 air emissions 691
 Alkali Blue 614ff.
 – chemistry, manufacture 615ff.
 – commercially available types 619ff.
 alkaline number of a pigment 63
 aluminium pigment lakes 638ff.
 Ames test 694
 amine-treated pigments 2, 150, 266
 1-aminoanthraquinone 524f.
 aminoanthraquinone pigments 535f.
 aminoplastics 180
 amorphous compounds 44
 amorphous pigments 46
 Aniline Black 665ff.
 anisotropy 126
 anthanthrone pigments 9, 561ff.
 anthrapyrimidine pigments 8, 546ff.
 anthraquinone pigments 8
 – hydrazone pigment 536ff.
 – heterocyclic 546ff.

– polycarbocyclic 557ff.
 application
 – miscellaneous 183, 613
 – other areas of 183
 – properties and concepts 51ff.
 aqueous pigment extracts
 – extraction methods 63f.
 – of electrical conductivity 63
 – of pH value 622
 areas of application 142ff.
 aromaticity 15
 artist's colors 650
 automotive finishes 50, 157ff.
 automotive refinishes 156
 azo dye 12, 20
 azo form 195
 azo metal complexes 642f., 644
 azo metal complex pigments 648ff.
 azomethine metal complexes 172, 643,
 737f.
 azomethine metal complex pigments 645f.
 azo pigments
 – see hydrazone pigments
 azo tautomeric form 194

b

barbituric acid 12
 barium pigments 690
 bathochromic shift 13f.
 benzimidazolone moiety 19
 benzimidazolone pigments 6, 7, 19,
 370ff.
 – application 381ff.
 – chemistry, manufacture 372
 – commercially available pigments 382ff.
 – crystal structure 372
 – solubility 19f.
 BET equation 24ff.
 bifunctional coupling components 252

- Biphenyl 16
 - bisacetoacetarylide pigments 5, 253, 278ff.
 - black panel temperature 96
 - blaine method 26
 - bleeding 67, 71ff., 172
 - blooming 68ff., 168
 - concentration limits 68f.
 - in elastomers 180
 - in LDPE 168
 - Blue Scale 95f.
 - BONA 6, 203, 301
 - pigment lakes 349ff.
 - brilliance of color 53
 - Brilliant Green 626
 - brittleness of plastics 356
 - 2B toner 353
 - 4B toner 358
- c**
- cable insulations 172
 - coverings 267
 - calandering 153
 - Carbazole Violet 426, 578, 580
 - carbonamide groups, introduction of 17
 - carcinogenic aromatic amines, list of 680
 - carcinogenicity 694f.
 - Casson flow model 111
 - cast resins 263
 - catalytic hydrogenation 200
 - cellulose derivatives, spin dyeing 181ff.
 - chalking 76f., 172
 - chemical characterization 20ff.
 - chemical constitution 11
 - blooming 67
 - influence on hue 11ff.
 - migration fastness 18ff.
 - solvent fastness 18ff.
 - tinctorial strength 25
 - weatherfastness 17f.
 - chloranil 570
 - Chlorinated Para Red (P.R.4) 291, 297f.
 - chroma 53
 - chromophor 14
 - chronic toxicity 694f.
 - CIELAB 55f., 97
 - system 55
 - Clayfield and Lumb theory 86
 - coatings 155ff.
 - coil coating 161
 - cold extraction method 63
 - colour 52ff.
 - concentrates 169
 - depth 55
 - differences 56
 - optical behaviour of pigmented coatings 56
 - scales 153
 - stimulus 52
 - tristimulus values 53
 - colour copy 154
 - colourants (threshold limits of metals) 1, 685
 - coloured pencils 183
 - colouristic properties 42ff.
 - Colour Index 95
 - conductivity of aqueous pigment extracts 63
 - conformation 41
 - conjugation 15
 - copper ferrocyanide 624, 629
 - copper phthalocyanine pigments 429ff.
 - cone-and-plate viscometer 117
 - CONEG Regulation 686
 - cosmetics 166, 183
 - Coulomb interactions 226
 - coupling 209ff.
 - compounds 201ff.
 - continuous process 217f.
 - techniques 211ff.
 - crayons 183
 - Critical Pigment Volume Concentration (CPVC) 86
 - crystal
 - adsorption 21
 - engineering 47
 - forms 17
 - manufacture 69, 223ff.
 - modifications 20ff., 41ff., 91f., 436ff.
 - *see also* polymorphism
 - change 43, 93, 106
 - detection 42
 - phases 40
 - stabilization of CuPc pigments 431
 - structure 11, 15f.
 - determination 15
 - prediction 11
 - Crystal Violet 626
 - crystallinity 45f.
 - crystallite size 49
 - cyan 153
- d**
- data representation 33
 - density distribution 34
 - numerical distribution 36

- sum distribution 36
- surface area distribution 36
- volume or mass distribution 36
- D&C Red 7 360
- D&C Red 36 300
- Debye-Scherrer X-ray diffraction
 - *see* X-ray powder diffraction
- decorative printing 152f.
- density distribution 34
- density functional theory (DFT) 469, 506
- depth of shade 55
- desagglomeration of pigment particles 79
- diallyl phthalate process 152
- diarylide yellow and orange pigments 253ff.
 - amine-treatment 150
 - application 259ff.
 - chemistry, manufacture 253ff.
 - commercially available pigments 262ff.
 - flushing process 94
 - mixed couplings 255
 - properties 258ff.
 - resination 359
 - thermal decomposition 261
- diazo components 197ff.
 - bifunctional 252
- diazonium compound 205ff., 217f.
- diazotization 206ff., 216f.
 - aprotic 212
 - continuous technique 216ff.
 - mechanism 207
 - methods 207
- differential thermal analysis 105
- dihaloterephthalic acid process 463
- 2,4-dihydroxy quinoline 12
- diketopyrrolo-pyrrole (DPP) pigments 8, 514ff.
 - chemistry and manufacture 514ff.
 - commercially available pigments 520ff.
 - properties and application 520
- dilatancy 114
- DIN color chart 54f., 129
- DIN scale 242
- Dinitraniline Orange 4, 296ff.
- dioxazine pigments 9, 569
- disazo condensation pigments
 - *see* dihydrazone condensation pigments
- disazo pigments
 - *see* dihydrazone pigments
- disazopyrazolone pigments
 - *see* dihydrazonepyrazolone pigments
- dihydrazone condensation pigments 4, 7, 403ff.
 - application 407f.
 - chemistry, manufacture 404ff.
 - commercially available pigments 409f.
 - properties 407ff.
- dihydrazone pigments 5, 251ff.
 - bisacetoacetarylide pigments 278ff.
 - diarylide yellow pigments 253ff.
- dihydrazonepyrazolone pigments 252
- dipole-dipole-interaction 40
- dispersibility 133
 - *see also* dispersion
- dispersion 78ff.
 - and the critical pigment volume concentration 86f.
 - definition 27
 - desagglomeration of pigment particles 80
 - determination of particle size 27ff.
 - distribution of the dispersed pigment in its medium 84
 - equipment, mode and operation 114f.
 - factors of influence 79
 - general considerations 78ff.
 - hardness 90
 - influence of particle size 124ff.
 - influence on application properties 78f.
 - in industrial finishes 156f.
 - in offset printing inks 89, 119
 - in plastics 163ff.
 - in PP 168f.
 - in PVC 168f.
 - test methods 87ff.
- dissolution in the application medium 108f.
- distortion 77, 168
- disturbances during processing of pigmented systems 75ff.
- DLVO theory 86
- domain size 44, 49
- DPP pigments 8, 514ff.
- DPP/quinacridone mixed crystal pigments 521
- dry cleaning 67
- dry rubbing 67
- dry spinning 182
- dyes
 - definition 1
 - migration in plastics 67ff.
 - salts with complex anions 622
- e**
- ecology 691ff.
- effect finishes 160
- elastomers 177f.
- electron acceptors 11, 17, 199

- electron beams curing systems 158
- electron diffraction 339
- electron donors 11, 12, 17
- electron microscopy 33f.
- electronic excitation 11, 40
- electrophotographical method 154
- emulsion paints 162f.
 - PVC 169ff.
- equivalent diameter 36f.
- European Color Scale 153, 242, 268
- Europeregulation (EC) nr.1935/2004/EEC 683
- exciton coupling 39
- exterior house paints 162f.
- extinction
 - coefficient, maximum molar 14
 - maximum 14
- f**
- factors determining the lightfastness 98
 - additives 101
 - pigment volume concentration 100
 - substrate 98
 - thickness of the layer 100
 - vehicle 98
- fastness
 - determination 61
 - to acids 62
 - to alkali 62
 - to bleaching with hypochlorite 66
 - to bleeding 67ff.
 - to chlorinated water 66
 - to concrete 64
 - to heat sealability 65
 - to light 94ff.
 - to lime 64
 - to migration 139ff.
 - to organic solvents 61f.
 - to overpigmentation 76f.
 - to seawater 66
 - to soap 62
 - to solvents 61f., 141ff.
 - – determination 61
 - – effects of the particle size 136ff.
 - – in polystyrene 175
 - – in polyurethane 174f.
 - – of migration 67ff., 139ff.
 - – of plastics 163
 - – of printed textiles 66
 - – of prints 62
 - to sterilisation 65
 - to transparent lacquer coatings 62
 - to water 57, 62
 - to weather 64ff.
- FD&C Blue 1 640
- FD&C Blue 2 665
- FD&C Red 3 639
- FD&C Red 38 639
- FD&C Yellow 5 248
- FD&C Yellow 6 367
- films 163
- filtration 201
- finishing
 - hydrazone pigments 202ff.
 - polycyclic pigments 425, 487
- flavanthronone pigments 9, 548ff., 653, 725
- flexo printing 144, 152
- floating 135, 161
- flocculates 23
- flocculation 135f.
 - of CuPc pigments 437
 - stability to 440
- flooding 135
- flop effect 451
- Florida exposure 581
- flow 141
- flow properties 114ff.
 - and rheological parameters 115ff.
 - influence 114ff., 118
 - of pigmental systems 114ff., 150ff.
 - of publication gravure inks 113
- fluorescein 639, 662
- flush pastes 93f.
- flushing process 93, 619
- food contact 179, 669, 671, 683
- food packaging 368, 369, 671, 683
- force fields 45, 47, 444
- g**
- gel varnishes 111, 147
 - structure 111
- general considerations 78ff.
- glass
 - coloration with organic pigments 393
- glass transition point 68
- glass transition temperature 176, 184
- globally harmonised system (GHS) 677
- gloss 64, 136ff.
 - of offset prints 144ff.
 - – time curve 91
 - of toluidine reds (haze) 136
- gravure printing 144
- Gray Scale 66, 72, 95, 141, 356, 385, 399, 402
- Grela Reds 301
- grindometer 89
- gypsum 42, 232

h

Hagen-Poiseuille equation 81
 HALS stabilizer 168, 500
 heat sealability 666
 heat sealing 65
 heat stability 144ff.
 – in elastomers 177f.
 – in plastics 163
 – in polyolefins 167ff.
 – in polystyrene 175
 – in spin dyeing 181ff.
 – of metal deco (tin) prints 148f.
 – of paint systems for radiators 161
 – phase transitions of polymorphous pigments 106
 – test methods 87ff.
 hemoglobin 426
 heterocyclic anthraquinone pigments 546ff.
 heteropolyacid 622, 623
 hiding power 60, 126
 high-density polyethylene (HDPE) 167f.
 high-solid systems 157
 highest occupied molecular orbital (HOMO) 40
 history 195
 hot extraction method 63
 hue 11ff., 51, 54, 122
 – and particle size distribution 121ff.
 hybrid pigments 669
 hydrates 41, 42
 hydrazone pigments 4ff., 193ff.
 – batch operation 219
 – coupling compounds 200f.
 – diazo components 197
 – diazo compounds 48f.
 – finishing 213ff.
 – history 195
 – important intermediates 204f.
 – lakes 337f.
 – nomenclature 196ff.
 – production units 219ff.
 – starting materials 196
 – synthesis 205ff.
 – by continuous technique 215ff.
 hydrogen bonding 15, 39, 227, 473
 hydroquinone process 464
 hydroxyanthraquinone pigments 544ff.
 2-hydroxy naphthalene (β -naphthol) 200
 2-hydroxy-3-naphthoic acid (BONA) 6, 202
 2-hydroxy-3-naphthoic acid anilides 5, 204, 300
 5-(2'-hydroxy-3'-naphthoilylamino)-benzimidazolone 6, 380
 hypsochromic shift 11, 12

i

IBB toner 357
 indanthrone 196, 548ff.
 indexing 45
 indigo 8
 industrial coatings 273ff.
 industrial finishes 156
 inkjet printing 283
 inner salts of sulfonic acids (Alkali Blue types) 614ff.
 inorganic pigments 2f., 160
 interfacial tension 81
 intermediates, important, for hydrazone pigments 193ff.
 ionic interactions 38, 350
 irradiance (measurement) 96
 irritation of skin and mucous membrane 692
 isoindolinone and isoindoline pigments 9, 586ff.
 – azomethine type 586ff.
 – chemistry, synthesis, starting materials 405ff.
 – methine type 587ff.
 – properties 597
 isomorphic 44
 isomorphism 44
 isostructural 44
 isoviolanthrone pigments 557ff.

k

Kaempfer method 71
 Karman-Kozeny equation 26
 kinetically stable 42
 Kodak Color Control Standards 242
 Kodak Scale 242, 264
 Kubelka-Munk relation 91
 Kubelka-Munk theory 57
 Kumis and Roteman equation 68

l

Lake Red C 4, 291, 319f.
 lakes 3
 laking 20, 338
 laminated plastic sheets 152
 laser printing 154
 lattice defects 49
 lattice-energy minimization 295
 lattice parameters 468
 legislation 675ff.
 – concerning organic pigments 681
 letterpress printing 100ff.

- lightfastness and weatherfastness 17f., 94ff., 131ff.
 – accelerated exposure equipment 97ff.
 – and chemical constitution 17f.
 – definition and general information 94f.
 – determining factors 98ff.
 – evaluation techniques and equipment 95ff.
 – in plastics 163
 lightness 53
 lime press 183
 low-density polyethylene (LDPE) 167
 lowest unoccupied molecular orbital (LUMO) 13
- m**
- magenta 153
 Malachite Green 626
 manufacturing the different crystal modifications of copper
 phthalocyanine 435
 – α -modification 436
 – β -modification 436
 – γ -, δ -, ϵ -modifications 436
 Marshal method 27
 median value 37
 medium-solid systems 157
 melamine resin sheets 160
 melt spinning 181
 metal complex, formation 20f.
 metal complex pigments 10, 640ff.
 – application 647
 – azo metal complexes 642f.
 – azomethine metal complexes 643f.
 – chemistry, synthesis 641f.
 – commercially available pigments 647ff.
 – properties 647
 metal deco printing 148f.
 metal impurities in toys 688
 metallic finishes 160
 methacrylate cast resins 175
 Methyl Violet 625
 Michler Ketone 625
 migration 67ff.
 – and chemical constitution 20
 – and particle size 119ff.
 – fastness 131ff.
 – fundamentals 52f.
 – in elastomers 177f.
 – in polyethylene 167
 – in polystyrene 175f.
 – in polyurethane 174ff.
 – in polyvinylchloride 169ff.
 – of prints on PVC 151
 – test methods 62ff.
 milling 214
 mixed coupling 43, 243
 mixed crystal 44, 339, 464, 475, 477
 mixed crystal phases 477, 524
 modification 530, 552
 molecular packing 562, 646
 monohydrazone pyrazolone pigments 193
 monohydrazone yellow and orange pigments 222ff.
 – application 233f.
 – chemistry, manufacture 253ff.
 – commercially available pigments 307ff.
 – crystal structure 292
 – definition 251
 – lakes 227, 229, 233ff.
 – properties 232f.
 – tinctorial strength 14
 monohydrazone yellow pigments 702
 morphology 38, 39, 41
 multicolor printing 144ff., 240
 multipurpose tinting pastes 162
 mutagenicity 692, 694
- n**
- $n \rightarrow \pi^*$ -transition 12
 nanocrystalline 49, 304
 nanocrystallinity 49
 naphthalene sulfonic acid pigment lakes 366ff.
 naphthalene-1,4,5,8-tetracarboxylic acid 489, 505
 naphthol AS pigments 4, 6, 300ff.
 – derivatives 204
 – pigment lakes 336ff.
 – application 309ff.
 – chemistry, manufacture 302ff.
 – commercially available pigments 307ff.
 – crystal structure 303f.
 – polymorphism 283
 – X-ray crystal structure analysis 229f.
 naphtholone 371
 NC chips 152
 Newtonian liquid 110
 nitro lacquers 156
 nitro-combination lacquers 156
 nomenclature of hydrazone pigments 196
 nonaqueous-dispersion systems(NAD systems) 157, 455
 non-impact printing 154
 non-laked monohydrazone yellow and orange pigments 223ff.
 Noyes and Whitney equation 140

- nucleation in polymers 77
numerical distribution 36
- o**
- office articles 183
offset printing 144ff.
oil absorption 26
optical behaviour of pigmented coatings 56
optical properties 41
organic pigments 2
– classification of 4
– history of 3
organic solvents 61f.
Orthonitraniline Orange (P.O.2) 296f.
oscillator strength 14
Ostwald equation / solubility of crystals 139
oven drying systems 156ff.
overcoating fastness 72
overpainting fastness 108
overpigmentation 76f.
overvarnishing 153
oxidatively drying paints 156
- p**
- π - π interaction 38
 π -stacking 38
 $\pi \rightarrow \pi^*$ -transition 12
packaging gravure printing 151f.
pair-distribution function (PDF) 46
paper mass colouration 183
paper surface coating in the lime press 183
Parachlor Red (P.R.6) 296, 300
Para Red (P.R.1) 290, 296
Para Toner (P.R.1) 296, 298
particle size
– and application properties of pigmented media 119ff.
– by electron microscopy 28ff.
– by ultrasedimentation 32ff.
– data representation 33ff.
– density distribution 34
– determination 27ff.
– distribution 26ff.
– of surface-coated pigments 32
– sum distribution 36
– surface area distribution 36
– volume or mass distribution 36
peak width 44
penetration of inks through the paper 151, 246
perinone pigments 8, 488ff.
perylene and perinone pigments 488ff.
perylene pigments 488ff.
pH of aqueous pigment extracts 63
phase- and flocculation-stability of
 phthalocyanine pigments 437ff.
phenylxanthene derivatives 627
phosphomolybdic acid 622
phosphotungstic acid 622
phosphotungstomolybdic acid 622
photosedimentometry 28
phototropicity 458
physical mixture 44
phthalic anhydride 428
– urea process 432
phthalocyanine manufacture 428ff.
– baking process (I) 429
– baking process (II) 432
– phthalic anhydride/urea process 432
– phthalonitrile process 429
– solvent method 433
– solvent process 430
phthalocyanine pigments 426ff.
– application 445f.
– commercially available pigments 477ff.
– crystal modifications 435ff.
– green types 438f.
– metal-free blue-types 439f.
– modifications 435ff.
– phase- and flocculation-stabilized types 437f.
– phthalonitrile process 428ff.
– properties 440ff.
phthalonitrile 428
– solvent process 430ff.
physical characterization of pigments 20ff.
– specific surface area 23
pigments, definition 1
pigment particles, shapes 23
pigment performance in special applications 65ff.
pigment plasticizer pastes 165
pigment preparations 165ff.
pigment single crystals 21f., 44
pigmented coatings, optical behaviour 56
pigments 1, 29
– with hitherto unknown chemical structure 666ff.
– with known chemical structure 655ff.
– miscellaneous pigments 10
Pigment Black 1 665f.
– molecular formula 665
– properties and applications 665
Pigment Black 20 669
– properties and applications 669
Pigment Black 31 504

- crystal structure 495
- molecular formula 498
- Pigment Black 32 504
 - crystal structure 496
 - molecular formula 498
- Pigment Blue 1 626, 633
 - molecular formula 631
 - properties and applications 633
- Pigment Blue 2 633
- Pigment Blue 9 633
 - molecular formula 631
 - properties and applications 633
- Pigment Blue 10 634
 - molecular formula 631
 - properties and applications 634
- Pigment Blue 14 634
 - molecular formula 632
 - properties and applications 634
- Pigment Blue 15 449ff.
 - molecular formula 426
 - properties and applications 444
- Pigment Blue 15:1 451ff.
 - crystal structure 441
 - molecular formula 444
 - properties and applications 451
- Pigment Blue 15:2 453
 - crystal structure 441
 - molecular formula 444
 - properties and applications 453
- Pigment Blue 15:3 454ff.
 - crystal structure 441
 - molecular formula 444
 - properties and applications 454
- Pigment Blue 15:4 456ff.
 - crystal structure 441
 - molecular formula 444
 - properties and applications 456
- Pigment Blue 15:6 456
 - crystal structure 441
 - molecular formula 444
 - properties and applications 456
- Pigment Blue 16 457f.
 - molecular formula 444
 - properties and applications 457
- Pigment Blue 18 619
 - molecular formula 619
- Pigment Blue 19 619
 - molecular formula 619
- Pigment Blue 24:1 639f.
 - properties and applications 640
- Pigment Blue 24:x 639
 - properties and applications 640
- Pigment Black 25 310, 337
 - molecular formula 310
 - properties and applications 310
- Pigment Blue 56 619
 - molecular formula 619
- Pigment Blue 60 554ff.
 - crystal structure 555
 - molecular formula 548
 - properties and applications 554
- Pigment Blue 61 619
 - molecular formula 619
- Pigment Blue 62 632, 634
 - molecular formula 632
 - properties and applications 634
- Pigment Blue 63 664, 695
 - molecular formula 664
 - properties and applications 664
- Pigment Blue 64 550
 - molecular formula 550
- Pigment Blue 65 568
 - crystal structure 568
 - molecular formula 568
 - properties and applications 568
- Pigment Blue 66 525
 - crystal structure 526
 - properties and applications 526
- Pigment Blue 75 444, 457
 - molecular formula 444
 - properties and applications 457
- Pigment Blue 78 640
 - properties and applications 640
- Pigment Blue 79 444, 457
 - crystal structure 442
 - molecular formula 444
 - properties and applications 457
- Pigment Blue 80 580
 - crystal structure 575
 - molecular formula 571
 - properties and applications 580
- Pigment Blue 82 672
 - properties and applications 672
- Pigment Blue 84 673
 - properties and applications 673
- Pigment Brown 1 312, 323f.
 - molecular formula 312
 - properties and applications 323
- Pigment Brown 5 352, 353, 362
 - molecular formula 352
 - properties and applications 362
- Pigment Brown 22 665
 - molecular formula 665
 - properties and applications 665
- Pigment Brown 23 323, 411, 419f.
 - molecular formula 411

- properties and applications 419
- Pigment Brown 25 384, 398f.
 - molecular formula 384
 - properties and applications 398
- Pigment Brown 38 600, 606
 - molecular formula 600
 - properties and applications 606
- Pigment Brown 41 411, 420
 - molecular formula 411
 - properties and applications 420
- Pigment Brown 42 411, 420
 - molecular formula 411
 - properties and applications 420
- Pigment Green 1 632, 634f.
 - molecular formula 632
 - properties and applications 634
- Pigment Green 2 638f
 - properties and applications 638
- Pigment Green 4 632, 634
 - molecular formula 632
 - properties and applications 634
- Pigment Green 7 457ff.
 - molecular formula 444
 - properties and applications 457
- Pigment Green 8 647f.
 - molecular formula 648
 - properties and applications 647
- Pigment Green 10 642, 650
 - molecular formula 648
 - properties and applications 650
- Pigment Green 36 444, 459
 - molecular formula 444
 - properties and applications 459
- Pigment Green 45 632, 634
 - molecular formula
 - properties and applications 634
- Pigment Orange 1 246
 - molecular formula 236
 - properties and applications 246
- Pigment Orange 2 297
 - molecular formula 296
 - properties and applications 297
- Pigment Orange 5 297f.
 - crystal structure 295
 - molecular formula 296
 - properties and applications 297
- Pigment Orange 6 247
 - molecular formula 237
 - properties and applications 247
- Pigment Orange 13 285f.
 - molecular formula 286
 - properties and applications 285
- Pigment Orange 15 264, 277
 - molecular formula 263
 - properties and applications 277
- Pigment Orange 16 264, 277
 - molecular formula 263
 - properties and applications 277
- Pigment Orange 17 342, 343
 - molecular formula 343
 - properties and applications 342
- Pigment Orange 17:1 343, 344
 - molecular formula 343
 - properties and applications 343
- Pigment Orange 19 367
 - molecular formula 368
 - properties and applications 367
- Pigment Orange 22 311, 323
 - molecular formula 311
 - properties and applications 323
- Pigment Orange 24 312, 323
 - molecular formula 311
 - properties and applications 323
- Pigment Orange 31 414
 - molecular formula 410
 - properties and applications 414
- Pigment Orange 34 136ff., 286f.
 - crystal structure 136
 - molecular formula 286
 - properties and applications 286
- Pigment Orange 36 383, 390f.
 - crystal structure 374
 - molecular formula 376, 383
 - properties and applications 390
- Pigment Orange 38 308, 335f.
 - molecular formula 308
 - properties and applications 335
- Pigment Orange 40 559
 - molecular formula 557
 - properties and applications 559
- Pigment Orange 43 510ff.
 - crystal structure 507
 - molecular formula 510
 - properties and applications 510
- Pigment Orange 44 264, 278
 - molecular formula 264
 - properties and applications 278
- Pigment Orange 46 343, 344
 - molecular formula 343
 - properties and applications 343
- Pigment Orange 47 264, 278
 - molecular formula 264
 - properties and applications 278
- Pigment Orange 48 479, 486
 - molecular formula 479
 - properties and applications 486

- Pigment Orange 49 479, 486
 - molecular formula 479
 - properties and applications 486
- Pigment Orange 51 560
 - molecular formula 557
 - properties and applications 560
- Pigment Orange 59 649, 653
 - molecular formula 649
 - properties and applications 653
- Pigment Orange 60 383, 392
 - molecular formula 383
 - properties and applications 392
- Pigment Orange 61 598, 604
 - molecular formula 598
 - properties and applications 604
- Pigment Orange 62 276, 390
 - crystal structure 378
 - molecular formula 383
 - properties and applications 390
- Pigment Orange 64 661f.
 - molecular formula 661
 - properties and applications 661
- Pigment Orange 65 653
 - crystal structure 646
 - properties and applications 653
- Pigment Orange 66 599, 605f.
 - molecular formula 593, 599
 - properties and applications 605
- Pigment Orange 67 661
 - molecular formula 662
 - properties and applications 661
- Pigment Orange 68 649, 654
 - molecular formula 649
 - properties and applications 654
- Pigment Orange 69 599, 605
 - molecular formula 599
 - properties and applications 605
- Pigment Orange 71 521f.
 - crystal structure 520
 - molecular formula 521
 - properties and applications 521
- Pigment Orange 72 378, 393f.
 - molecular formula 383
 - properties and applications 393
- Pigment Orange 73 522f.
 - crystal structure 519
 - molecular formula 521
 - properties and applications 522
- Pigment Orange 74 336
 - molecular formula 314
 - properties and applications 336
- Pigment Orange 77 565
 - molecular formula 565
 - properties and applications 565
- Pigment Orange 79 367
 - molecular formula 367
 - properties and applications 367
- Pigment Orange 80 534
 - molecular formula 534
 - properties and applications 534
- Pigment Orange 81 522
 - molecular formula 521
 - properties and applications 522
- Pigment Orange 83 667
- Pigment Orange 84 671
 - properties and applications 671
- Pigment Red 1 292, 298
 - crystal structure 294
 - molecular formula 296
 - properties and applications 298
- Pigment Red 2 308, 310ff.
 - molecular formula 311
 - properties and applications 310, 314
- Pigment Red 3 23, 298f., 300
 - blooming in plastized PVC 68f.
 - crystal structure 292
 - haze 136
 - molecular formula 308
 - properties and applications 298
 - solubility in dibutyl phthalate 61
- Pigment Red 4 290, 299f.
 - molecular formula 296
 - properties and applications 299
- Pigment Red 5 315, 324f.
 - molecular formula 311
 - properties and applications 324
- Pigment Red 6 293, 300f.
 - molecular formula 296
 - properties and applications 300
- Pigment Red 7 310, 315
 - molecular formula 311
 - properties and applications 315
- Pigment Red 8 311, 315f.
 - molecular formula 311
 - properties and applications 315
- Pigment Red 9 310, 315
 - molecular formula 311
 - properties and applications 315
- Pigment Red 10 311, 316f.
 - molecular formula 311
 - properties and applications 316
- Pigment Red 11 311, 316
 - molecular formula 311
 - properties and applications 316
- Pigment Red 12 311, 317f.
 - molecular formula 311

- properties and applications 317
- Pigment Red 13 311, 317
 - molecular formula 311
- properties and applications 317
- Pigment Red 14 311, 318f.
 - molecular formula 311
- properties and applications 318
- Pigment Red 15 311, 318
 - molecular formula 311
- properties and applications 318
- Pigment Red 16 311, 318
 - molecular formula 311
- properties and applications 318
- Pigment Red 17 312, 318
 - molecular formula 311
- properties and applications 318
- Pigment Red 18 312, 319
 - molecular formula 312
- properties and applications 319
- Pigment Red 21 312, 319
 - molecular formula 312
- properties and applications 319
- Pigment Red 22 312, 319
 - molecular formula 312
- properties and applications 319
- Pigment Red 23 312, 319
 - molecular formula 312
- properties and applications 319
- Pigment Red 31 312, 325f.
 - molecular formula 312
- properties and applications 325
- Pigment Red 32 312, 325
 - molecular formula 312
- properties and applications 325
- Pigment Red 37 285, 288f.
 - molecular formula 286
- properties and applications 288
- Pigment Red 38 285, 288
 - molecular formula 286
- properties and applications 288
- Pigment Red 41 286, 289f.
 - molecular formula 286
- properties and applications 289
- Pigment Red 48:1 353ff.
 - molecular formula 353
- properties and applications 353
- Pigment Red 48:2 354f.
 - molecular formula 353
- properties and applications 354
- Pigment Red 48:3 353, 355f
 - molecular formula 353
- properties and applications 355
- Pigment Red 48:4 104, 353, 356f.
 - molecular formula 352
- properties and applications 355
- Pigment Red 48:5 353, 357f.
 - molecular formula 353
- properties and applications 357
- Pigment Red 49 344f.
 - molecular formula 343
- properties and applications 344
- Pigment Red 49:1 345f.
 - crystal structure 341
- molecular formula 343
- properties and applications 345
- Pigment Red 49:2 345f.
 - crystal structure 342
- molecular formula 343
- properties and applications 345
- Pigment Red 49:3 343
 - molecular formula 343
- Pigment Red 50:1 345ff.
 - molecular formula 343
- properties and applications 345
- Pigment Red 51 343, 345
 - molecular formula 343
- properties and applications 345
- Pigment Red 52:1 353, 357
 - molecular formula 353
- properties and applications 357
- Pigment Red 52:2 353, 358
 - molecular formula 353
- properties and applications 358
- Pigment Red 53 343, 346
 - molecular formula 343
- properties and applications 346
- Pigment Red 53:1 4, 85, 98, 141, 343, 346f.
 - molecular formula 343
- properties and applications 346
- Pigment Red 53:2 339
 - crystal structure 340
- molecular formula 343
- properties and applications 339
- Pigment Red 53:3 343, 348
 - molecular formula 343
- properties and applications 348
- Pigment Red 57:1 4, 98, 150, 357ff.
 - crystal structure 228
- molecular formula 352
- properties and applications 357
- Pigment Red 58:2 353, 360
 - molecular formula 353
- properties and applications 360
- Pigment Red 58:4 353, 360f.
 - molecular formula 353
- properties and applications 360

- Pigment Red 58types 360
- Pigment Red 60 367f.
 - molecular formula 368
 - properties and applications 367
- Pigment Red 63:1 357, 361
 - molecular formula 353
 - properties and applications 361
- Pigment Red 63:2 361f.
 - properties and applications 361
- Pigment Red 64 353
 - molecular formula 353
 - properties and applications 361
- Pigment Red 64:1 361
 - molecular formula 353
 - properties and applications 361
- Pigment Red 66 369f.
 - molecular formula 368
 - properties and applications 369
- Pigment Red 67 369ff.
 - molecular formula 368
 - properties and applications 369
- Pigment Red 68 348f.
 - molecular formula 343
 - properties and applications 348
- Pigment Red 80 635
 - molecular formula 635
- Pigment Red 81 635f.
 - molecular formula 635
 - properties and applications 635
- Pigment Red 81:1 635f.
 - molecular formula 635
 - properties and applications 635
- Pigment Red 81:2 635f.
 - molecular formula 635
 - properties and applications 635
- Pigment Red 81:3 635f.
 - molecular formula 635
 - properties and applications 635
- Pigment Red 81:4 635f.
 - molecular formula 635
 - properties and applications 635
- Pigment Red 81:5 635
 - molecular formula 635
- Pigment Red 81:6 635
 - molecular formula 635
- Pigment Red 81:x 635f.
 - molecular formula 635
 - properties and applications 635
- Pigment Red 81:y 635f.
 - molecular formula 635
 - properties and applications 635
- Pigment Red 83 546f.
 - molecular formula 545
 - properties and applications 546
- Pigment Red 88 530f.
 - crystal structure 528
 - molecular formula 529
 - properties and applications 530
- Pigment Red 89 543
 - molecular formula 540
 - properties and applications 543
- Pigment Red 90 661, 662f.
 - molecular formula 663
 - properties and applications 662
- Pigment Red 95 320f.
 - molecular formula 312
 - properties and applications 320
- Pigment Red 111 286, 289
 - molecular formula 286
 - properties and applications 289
- Pigment Red 112 320f.
 - molecular formula 312
 - properties and applications 320
- Pigment Red 114 322
 - molecular formula 312
 - properties and applications 322
- Pigment Red 119 322
 - molecular formula 312
 - properties and applications 322
- Pigment Red 122 482f.
 - molecular formula 479
 - properties and applications 482
- Pigment Red 123 498f.
 - crystal structure 494
 - molecular formula 491, 498
 - properties and applications 498
- Pigment Red 136 322
 - molecular formula 312
 - properties and applications 322
- Pigment Red 144 414
 - molecular formula 411
 - properties and applications 414
- Pigment Red 146 325f.
 - molecular formula 312
 - properties and applications 325
- Pigment Red 147 326
 - molecular formula 312
 - properties and applications 326
- Pigment Red 148 323f.
 - molecular formula 312
 - properties and applications 323
- Pigment Red 149 500f.
 - crystal structure 494
 - molecular formula 499
 - properties and applications 500
- Pigment Red 150 327

- molecular formula 313
- properties and applications 327
- Pigment Red 151 363f.
 - molecular formula 363
 - properties and applications 363
- Pigment Red 164 327
 - molecular formula 313
 - properties and applications 327
- Pigment Red 166 415f.
 - molecular formula 411
 - properties and applications 415
- Pigment Red 168 562
 - crystal structure 563
 - molecular formula 562
 - properties and applications 562
- Pigment Red 169 636f.
 - molecular formula 635
 - properties and applications 636
- Pigment Red 170 47, 70ff., 328
 - blooming 70ff.
 - crystal structure 305, 306
 - molecular formula 308
 - properties and applications 328
- Pigment Red 171 393
 - molecular formula 384
 - properties and applications 393
- Pigment Red 172 639f.
 - molecular formula 639
 - properties and applications 639
- Pigment Red 175 394f.
 - molecular formula 109
 - properties and applications 394
- Pigment Red 176 395f.
 - molecular formula 384
 - properties and applications 395
- Pigment Red 177 543f.
 - crystal structure 539
 - molecular formula 538
 - properties and applications 543
- Pigment Red 178 499, 501
 - crystal structure 495
 - molecular formula 499
 - properties and applications 501
- Pigment Red 179 499, 502f.
 - crystal structure 495
 - molecular formula 499
 - properties and applications 502
- Pigment Red 181 532
 - molecular formula 530
 - properties and applications 532
- Pigment Red 184 330f.
 - molecular formula 313
 - properties and applications 330
- Pigment Red 185 397f.
 - molecular formula 384
 - properties and applications 397
- Pigment Red 187 330f.
 - molecular formula 308
 - properties and applications 330
- Pigment Red 188 331
 - molecular formula 313
 - properties and applications 331
- Pigment Red 190 502
 - molecular formula 499
 - properties and applications 502
- Pigment Red 192 479, 484
 - molecular formula 479
 - properties and applications 484
- Pigment Red 194 512ff.
 - crystal structure 509
 - molecular formula 505
 - properties and applications 512
- Pigment Red 200 361
 - molecular formula 353
 - properties and applications 361
- Pigment Red 202 479, 484f.
 - molecular formula 479
 - properties and applications 484
- Pigment Red 204 667
 - properties and applications 667
- Pigment Red 206 479, 485
 - molecular formula 479
 - properties and applications 485
- Pigment Red 207
 - molecular formula 479
 - properties and applications 484
- Pigment Red 208 396f.
 - crystal structure 374
 - molecular formula 384
 - properties and applications 396
- Pigment Red 209 479, 485
 - molecular formula 479
 - properties and applications 485
- Pigment Red 210 332
 - molecular formula 313
 - properties and applications 332
- Pigment Red 211 364
 - molecular formula 363
 - properties and applications 364
- Pigment Red 212 332
 - molecular formula 313
 - properties and applications 332
- Pigment Red 213 332
 - crystal structure 401
 - molecular formula 313, 401
 - properties and applications 332

- Pigment Red 214 416
 - molecular formula 411
 - properties and applications 416
- Pigment Red 216 560f.
 - molecular formula 557
 - properties and applications 560
- Pigment Red 220 417
 - molecular formula 411
 - properties and applications 417
- Pigment Red 221 417
 - molecular formula 411
 - properties and applications 417
- Pigment Red 222 332f.
 - molecular formula 313
 - properties and applications 332
- Pigment Red 223 333
 - molecular formula 313
 - properties and applications 333
- Pigment Red 224 502f.
 - crystal structure 492
 - molecular formula 499
 - properties and applications 502
- Pigment Red 226 561
 - molecular formula 557
 - properties and applications 561
- Pigment Red 237 364
 - molecular formula 363
 - properties and applications 364
- Pigment Red 238 333
 - molecular formula 313
 - properties and applications 333
- Pigment Red 239 364f.
 - molecular formula 363
 - properties and applications 364
- Pigment Red 240 364f.
 - molecular formula 363
 - properties and applications 364
- Pigment Red 242 418f.
 - molecular formula 411
 - properties and applications 418
- Pigment Red 243 365ff.
 - molecular formula 363
 - properties and applications 365
- Pigment Red 245 333
 - molecular formula 313
 - properties and applications 333
- Pigment Red 247 365
 - molecular formula 363
 - properties and applications 365
- Pigment Red 248 418
 - molecular formula 411
 - properties and applications 418
- Pigment Red 251 544
 - molecular formula 537
 - properties and applications 544
- Pigment Red 252 664
 - molecular formula 664
 - properties and applications 664
- Pigment Red 253 333
 - molecular formula 313
 - properties and applications 333
- Pigment Red 254 522ff.
 - crystal structure 516
 - molecular formula 521
 - properties and applications 522
- Pigment Red 255 523
 - crystal structure 516
 - molecular formula 521
 - properties and applications 523
- Pigment Red 256 334
 - molecular formula 313
 - properties and applications 334
- Pigment Red 257 654
 - molecular formula 649
 - properties and applications 654
- Pigment Red 258 334
 - molecular formula 313
 - properties and applications 334
- Pigment Red 260 605
 - molecular formula 599
 - properties and applications 605
- Pigment Red 261 334
 - molecular formula 313
 - properties and applications 334
- Pigment Red 262 419
 - molecular formula 411
 - properties and applications 419
- Pigment Red 264 523
 - crystal structure 518
 - molecular formula 521
 - properties and applications 523
- Pigment Red 266 334
 - molecular formula 313
 - properties and applications 334
- Pigment Red 267 334
 - molecular formula 313
 - properties and applications 334
- Pigment Red 268 335
 - molecular formula 314
 - properties and applications 335
- Pigment Red 269 335
 - molecular formula 314
 - properties and applications 335
- Pigment Red 270 524
 - molecular formula 521
 - properties and applications 524

- Pigment Red 271 654
 - molecular formula 650
 - properties and applications 654
- Pigment Red 272 524
 - molecular formula 521
 - properties and applications 524
- Pigment Red 273
 - molecular formula 368
- Pigment Red 274 368
 - molecular formula 368
- Pigment Red 276 369
 - molecular formula 368
 - properties and applications 369
- Pigment Red 277 369
 - molecular formula 368
 - properties and applications 369
- Pigment Red 278 668
 - properties and applications 668
- Pigment Red 279 534
 - crystal structure 533
 - molecular formula 534
 - properties and applications 534
- Pigment Red 282 479
 - molecular formula 479
- Pigment Red 283 524
 - molecular formula 521
 - properties and applications 524
- Pigment Red 285 668
 - properties and applications 668
- Pigment Red 286 671
 - properties and applications 671
- Pigment Red 287 672
 - properties and applications 672
- Pigment Red 288 672
 - properties and applications 672
- Pigment Violet 1 628, 637
 - molecular formula 635
 - properties and applications 637
- Pigment Violet 1:1 635
 - molecular formula 635
 - properties and applications 637
- Pigment Violet 2 628, 637
 - molecular formula 635
 - properties and applications 637
- Pigment Violet 3 625, 630, 631
 - molecular formula 631
 - properties and applications 630
- Pigment Violet 4
 - molecular formula 631
- Pigment Violet 5:1 546
 - properties and applications 546
- Pigment Violet 13 336
 - molecular formula 314
 - properties and applications 336
- Pigment Violet 19 478f.
 - crystal structure 470
 - molecular formula 479
 - properties and applications 478
 - β -modification 478f.
 - γ -modification 83ff., 481f.
- Pigment Violet 23 577
 - crystal structure 574
 - molecular formula 477
 - properties and applications 577
- Pigment Violet 25 336
 - molecular formula 314
 - properties and applications 336
- Pigment Violet 27 630
 - molecular formula 631
 - properties and applications 630
- Pigment Violet 29 503
 - crystal structure 493
 - molecular formula 499
 - properties and applications 503
- Pigment Violet 31 567f.
 - molecular formula 567
 - properties and applications 567
- Pigment Violet 32 397
 - molecular formula 384
 - properties and applications 397
- Pigment Violet 34
 - molecular formula 571
- Pigment Violet 35
 - molecular formula 571
- Pigment Violet 37 580
 - molecular formula 571
 - properties and applications 580
- Pigment Violet 39 633
 - molecular formula 631
 - properties and applications 633
- Pigment Violet 42 486
 - molecular formula 479
 - properties and applications 486
- Pigment Violet 44 336
 - molecular formula 314
 - properties and applications 336
- Pigment Violet 50 337
 - molecular formula 314
 - properties and applications 337
- Pigment Violet 51 669
 - properties and applications 669
- Pigment Violet 52 370
 - molecular formula 368
- Pigment Violet 55 486
 - molecular formula 479
 - properties and applications 486

- Pigment Violet 57 580
 - crystal structure 576
 - molecular formula 571
 - properties and applications 580
- Pigment Violet 58 672
 - properties and applications 672
- Pigment Volume Concentration (PVC) 79, 86
- Pigment Yellow 1 235
 - application 239f.
 - blooming 73, 74
 - crystal structure 226
 - molecular formula 236
 - properties and applications 235
 - solubility in dibutyl phthalate 61
 - tinctorial strength/particle size 237ff.
- Pigment Yellow 2 239f.
 - molecular formula 236
 - properties and applications 239
- Pigment Yellow 3 240
 - molecular formula 236
 - properties and applications 240
- Pigment Yellow 5 240
 - molecular formula 236
 - properties and applications 240
- Pigment Yellow 6 241
 - crystal structure 226
 - molecular formula 236
 - properties and applications 241
- Pigment Yellow 10 241
 - crystal structure 228
 - molecular formula 237
 - properties and applications 241
- Pigment Yellow 12 264ff.
 - crystal structure 256
 - molecular formula 256, 263
 - properties and applications 264
- Pigment Yellow 13 266ff.
 - crystal structure 257
 - molecular formula 263
 - properties and applications 266
- Pigment Yellow 14 268f.
 - crystal structure 257
 - molecular formula 263
 - properties and applications 268
- Pigment Yellow 16 281f., 695
 - molecular formula 280
 - properties and applications 281
- Pigment Yellow 17 269f.
 - molecular formula 263
 - properties and applications 269
- Pigment Yellow 24 556f.
 - molecular formula 550
 - properties and applications 556
- Pigment Yellow 49 241
 - molecular formula 236
 - properties and applications 241
- Pigment Yellow 55 270f.
 - molecular formula 263
 - properties and applications 270
- Pigment Yellow 60 241
 - molecular formula 237
 - properties and applications 241
- Pigment Yellow 61 247
 - molecular formula 238
 - properties and applications 247
- Pigment Yellow 62 247f.
 - molecular formula 238
 - properties and applications 247
- Pigment Yellow 63 271
 - crystal structure 257
 - molecular formula 263
 - properties and applications 271
- Pigment Yellow 65 241
 - crystal structure 226
 - molecular formula 236
 - properties and applications 241
- Pigment Yellow 73 242
 - molecular formula 236
 - properties and applications 242
- Pigment Yellow 74 242f.
 - crystal structure 227
 - molecular formula 236
 - properties and applications 242
- Pigment Yellow 75 243
 - molecular formula 236
 - properties and applications 243
- Pigment Yellow 81 271f.
 - molecular formula 263
 - properties and applications 271
- Pigment Yellow 83 272f., 695
 - crystal structure 257
 - molecular formula 263
 - properties and applications 272
- Pigment Yellow 87 273
 - molecular formula 263
 - properties and applications 273
- Pigment Yellow 90 273
 - molecular formula 263
 - properties and applications 273
- Pigment Yellow 93 409ff.
 - molecular formula 410
 - properties and applications 409
- Pigment Yellow 94 412f.
 - molecular formula 410
 - properties and applications 412
- Pigment Yellow 95 412f.

- molecular formula 410
- properties and applications 412
- Pigment Yellow 97 243f.
 - crystal structure 227
 - molecular formula 236
 - properties and applications 243
- Pigment Yellow 98 245
 - molecular formula 236
 - properties and applications 245
- Pigment Yellow 99 666
 - properties and applications 666
- Pigment Yellow 100 248, 695
 - molecular formula 238
 - properties and applications 248
- Pigment Yellow 101 655f.
 - crystal structure 656
 - molecular formula 655, 656
 - properties and applications 655
- Pigment Yellow 104 367, 695
 - molecular formula 368
 - properties and applications 367
- Pigment Yellow 106 273f.
 - molecular formula 263
 - properties and applications 273
- Pigment Yellow 108 548
 - molecular formula 547
 - properties and applications 548
- Pigment Yellow 109 600f
 - molecular formula 598
 - properties and applications 600
- Pigment Yellow 110 589ff., 601f.
 - crystal structure 592, 593
 - molecular formula 590
 - properties and applications 601
- Pigment Yellow 111 245
 - molecular formula 236
 - properties and applications 245
- Pigment Yellow 113 274
 - molecular formula 263
 - properties and applications 274
- Pigment Yellow 114 274
 - molecular formula 263
 - properties and applications 274
- Pigment Yellow 116 245f.
 - molecular formula 236
 - properties and applications 245
- Pigment Yellow 117 651
 - molecular formula 648
 - properties and applications 651
- Pigment Yellow 120 382f.
 - molecular formula 383
 - properties and applications 382
- Pigment Yellow 121 274
 - molecular formula 263
 - properties and applications 274
- Pigment Yellow 123 540
 - molecular formula 540
- Pigment Yellow 124 275
 - molecular formula 263
 - properties and applications 275
- Pigment Yellow 126 275
 - molecular formula 263
 - properties and applications 275
- Pigment Yellow 127 275
 - molecular formula 263
 - properties and applications 275
- Pigment Yellow 128 413f.
 - molecular formula 410
 - properties and applications 413
- Pigment Yellow 129 651f.
 - molecular formula 648
 - properties and applications 651
- Pigment Yellow 130 246
 - molecular formula 236
 - properties and applications 246
- Pigment Yellow 133 248
 - molecular formula 238
 - properties and applications 248
- Pigment Yellow 136 275f.
 - molecular formula 263
 - properties and applications 275
- Pigment Yellow 138 585
 - crystal structure 584
 - molecular formula 584
 - properties and applications 585
- Pigment Yellow 139 602f.
 - crystal structure 596
 - molecular formula 595
 - properties and applications 602
- Pigment Yellow 142 248
 - molecular formula 238
 - properties and applications 248
- Pigment Yellow 147 542
 - molecular formula 541
 - properties and applications 542
- Pigment Yellow 148 657
 - molecular formula 657
 - properties and applications 657
- Pigment Yellow 150 652
 - molecular formula 643
 - properties and applications 652
- Pigment Yellow 151 385f.
 - crystal structure 378
 - molecular formula 383
 - properties and applications 385
- Pigment Yellow 152 276

- molecular formula 263
- properties and applications 276
- Pigment Yellow 153 652f.
 - molecular formula 649
 - properties and applications 652
- Pigment Yellow 154 386f.
 - crystal structure 377
 - molecular formula 383
 - properties and applications 386
- Pigment Yellow 155 282f.
 - crystal structure 281
 - molecular formula 280
 - properties and applications 282
- Pigment Yellow 165 246
 - molecular formula 237
 - properties and applications 246
- Pigment Yellow 166 414
 - molecular formula 410
 - properties and applications 410
- Pigment Yellow 167 246
 - molecular formula 237
 - properties and applications 246
- Pigment Yellow 168 248
 - molecular formula 238
 - properties and applications 248
- Pigment Yellow 169 248
 - molecular formula 238
 - properties and applications 248
- Pigment Yellow 170 276
 - molecular formula 263
 - properties and applications 276
- Pigment Yellow 171 276
 - molecular formula 263
 - properties and applications 276
- Pigment Yellow 172 276
 - molecular formula 263
 - properties and applications 276
- Pigment Yellow 173 603
 - molecular formula 587
 - properties and applications 603
- Pigment Yellow 174 276f.
 - molecular formula 263
 - properties and applications 276
- Pigment Yellow 175 387f.
 - molecular formula 383
 - properties and applications 387
- Pigment Yellow 176 277
 - molecular formula 264
 - properties and applications 277
- Pigment Yellow 177 653
 - molecular formula 645
 - properties and applications 653
- Pigment Yellow 179 653
 - molecular formula 645
 - properties and applications 653
- Pigment Yellow 180 388
 - molecular formula 383
 - properties and applications 388
- Pigment Yellow 181
 - crystal structure 379
 - molecular formula 383
 - properties and applications 389
- Pigment Yellow 182 657f.
 - molecular formula 657
 - properties and applications 657
- Pigment Yellow 183 249
 - crystal structure 230
 - molecular formula 238
 - properties and applications 249
- Pigment Yellow 185 604
 - molecular formula 593
 - properties and applications 604
- Pigment Yellow 187 667
 - properties and applications 667
- Pigment Yellow 188 277
 - molecular formula 264
 - properties and applications 277
- Pigment Yellow 190 249
 - molecular formula 238
 - properties and applications 249
- Pigment Yellow 191 42ff., 249f.
 - crystal structure 230
 - molecular formula 239
 - properties and applications 249
- Pigment Yellow 191:1 250
 - molecular formula 239
 - properties and applications 250
- Pigment Yellow 192 513
 - molecular formula 513
 - properties and applications 513
- Pigment Yellow 193 542
 - molecular formula 541
 - properties and applications 542
- Pigment Yellow 194 390
 - crystal structure 379
 - molecular formula 383
 - properties and applications 390
- Pigment Yellow 196
 - molecular formula 513
 - properties and applications 513
- Pigment Yellow 198 283
 - molecular formula 280
 - properties and applications 283
- Pigment Yellow 199 543
 - molecular formula 539
 - properties and applications 543

- Pigment Yellow 201 659
 - molecular formula 659
 - properties and applications 659
- Pigment Yellow 202 541
 - molecular formula 541
- Pigment Yellow 203 246
 - molecular formula 236
 - properties and applications 246
- Pigment Yellow 205 250
 - molecular formula 238
 - properties and applications 250
- Pigment Yellow 206 250
 - molecular formula 238
 - properties and applications 250
- Pigment Yellow 209 251
 - molecular formula 239
 - properties and applications 251
- Pigment Yellow 209:1 251
 - molecular formula 239
 - properties and applications 251
- Pigment Yellow 212 251, 283
 - molecular formula 239
 - properties and applications 251
- Pigment Yellow 213 401ff.
 - crystal structure 401
 - molecular formula 401
 - properties and applications 402
- Pigment Yellow 214 667
 - properties and applications 667
- Pigment Yellow 218 659, 660
 - molecular formula 660
 - properties and applications 660
- Pigment Yellow 219
 - molecular formula 279
 - properties and applications 283
- Pigment Yellow 220 660
 - molecular formula 660
 - properties and applications 660
- Pigment Yellow 221 660f.
 - molecular formula 660
 - properties and applications 660
- Pigment Yellow 222 670
 - properties and applications 670
- Pigment Yellow 223 670
 - properties and applications 670
- Pigment Yellow 224 671
 - properties and applications 671
- Pigment Yellow 226 671
 - properties and applications 670
- planarity of molecules 15
- plastic viscosity 112
- plastics, coloration of 163ff.
 - additives 163
 - brittleness 168
 - coloration of granulated types 176
 - coloration of types in powder form 176
 - crystalline types 168
 - dispersibility of pigments 165, 170
 - heat stability 168
 - lightfastness 94ff., 131, 159, 160
 - processing 163
 - equipment 166
 - shrinkage 168
 - thin films 269
- plastisol 171ff.
- plate-out 75f., 158, 172
- PMMA 176, 418
- polyacrylonitrile (PAC) 182
- polyamide (PA) 183
 - spin dyeing 183ff.
- polycarbocyclic anthraquinone pigments 557ff.
- polycarbonate (PC) 175
- polychlorbiphenyls (PCBs) 689
- polycyclic pigments 425ff.
- polyester (PETP) 182f.
 - laminated sheets 175
- polyethylene (PE) 169ff.
- poly(methyl methacrylate) (PMMA) 176ff.
- polymorph
 - screening 42, 47
- polymorphic forms 38ff.
- polymorphism 37ff., 552
 - *see also* crystal modification
- polyolefins (PO) 167ff.
- polyoxymethylen 175
- polypropylene (PP) 167ff.
- polystyrene (PS) 175f.
- polyurethane (PUR) 174f.
 - tropics test 64
- poly(vinyl chloride) (PVC) 169f.
 - plastisols 171
- powder coating 158
- powder diagram 468ff.
- prediction of crystal structure; crystal engineering 47
- preferred orientation 44, 467
- premixed pigment concentrates 169
- premixed pigments 165f.
- preprogrammed colorants 165
- presscakes 94
- primary particles 21, 27
- primuline base 628

- printing
 - general 144
 - gravure printing 149
 - non-impact printing 154
 - offset printing 144
 - security printing 155
 - solvent-based flexographic packaging printing 152
- process control 219
- processing methods for plastics 163ff.
- pseudopolymorph 41
- publication gravure inks 116, 149ff.
- purity criteria 685f.
- pyranthrone pigments 9, 557ff.
- pyrazolone 204
 - pigments 224
 - sulfonic acid lakes 229

- q**
- quantum-mechanical methods 45, 47
- quinacridone pigments 7, 460f.
 - acidic ring closure 463
 - application 477
 - color of solutions 471
 - commercially available types 477ff.
 - manufacture, starting materials 461ff.
 - polymorphism 466ff.
 - properties 477f.
 - substituted types 465f.
 - thermal ring closure 461
- quinacridonequinone pigments 464f.
- o*-quinonehydrazone form 292
- quinophthalone pigments 9, 581ff.
- quinolonoquinolone pigments 659
- quinoxalinedione pigments 400

- r**
- REACH (European Union) 679
- REACH Restricted Substances List 679
- reagglomeration 86, 118, 135
- recrystallization 62f., 91, 147
 - and particle size 141
 - in packaging printing inks 149
 - in publication printing inks 151
- real azo pigments 194
- red azo pigment lakes
 - *see* red hydrazone pigment lakes
- real-space methods 45
- red hydrazone pigment lakes 337, 706
- reduction methods 199
 - catalytic hydrogenation 199
 - transfer hydrogenation with hydrazine 200
 - with iron 199
 - with sodium hydrogen sulfide or sodium sulphide 200
 - with zinc in an alkaline medium 199
- reflectance 60
- reflection 44
- refractive indices 127f.
- regulation (EC) No 1935/2004 683
- remission 57
- resin 63
- resinated pigments 269
- resination 359
- rheological measurements 116ff.
- rheological properties 110ff.
- rheopexy 114
- rhodamine B 628
- Rietveld refinement 46, 468
- rubber poison content 177f.
- rub-out effect 30, 530
- rules for azo dyes 12

- s**
- sandwich method 71f.
- scanning electron microscopy 29
- scattering 56
 - constants 57
- Scherrer formula 49
- scratch fastness 162
- screen printing 144
- semiperinone 488, 513
- shortness 115
- shrinkage
 - *see* nucleation in polymers
- silicomolybdic acid 624
- silver lacquer 62, 148
- single-crystal X-ray structure analysis 44
- small-angle grain boundaries 49
- soap 62
- solar radiation 97
- solid solutions 44, 258, 475
 - of quinacridones 475
- solubility 61f., 139ff.
 - effect of temperature 61, 68f.
 - effect of the particle size distribution 139ff., 159
 - in the application medium 108f.
- solvates 41, 339
- solvent 28
 - chemical constitution 20
 - fastness 28, 143f.
- solvent and migration fastness 18
 - avoiding solubilizing substituents and adding insolubilizing moieties 18

- formation of insoluble polar salts by laking 20
 - formation of metal complexes 20
 - increasing the molecular weight 18
 - special application fastness 61ff.
 - specific resistance in aqueous pigment extracts 63
 - specific surface area 23ff.
 - determination according to BET methods 24
 - determination by adsorption methods 24ff.
 - spin dyeing 181ff.
 - of polyacrylonitrile (PAC) 182
 - of polyamide (PA) 183
 - of polyester (PETP) 182
 - of viscose 183
 - spraying-pouring test 160
 - stabilization of dispersed particles 80f.
 - standard depth of shade (SD) 66
 - standard shades 454
 - standard solvents mixture 62
 - streaming effect 27
 - structure-property relationship 38
 - styrene-copolymers 175f.
 - sum distribution 36
 - supercritical CO₂ 43
 - surface area distribution 36
 - surface tension 81
 - synchrotron data 46
- t**
- tack of printing inks 115
 - tackmeter 115
 - tailor-made force fields 47
 - tautomeric state 583
 - tautomerism 209
 - test methods 87
 - tetrachloroisindolinone pigments 597, 731ff.
 - textile fastness properties 66f.
 - textile printing inks 262
 - texture effects 44
 - thermal pigment decomposition 105
 - thermal ring closure 461
 - thermal stability 104ff.
 - thermodynamics of interfaces 81
 - thermosetting plastics 179f.
 - thiazine indigo pigments 525, 532
 - thioindigo pigments 8, 526ff.
 - thixotropy 113, 149
 - tinctorial properties 51
 - tinctorial strength 14, 58ff., 120ff.
 - time curves 90
 - Toluidine Red 4 290f.
 - haze 136
 - 2B toner 353
 - 4B toner 358
 - toner particles 154
 - toners 3, 228
 - toning 578f.
 - toxicity after repeated application 694
 - toxicology 692ff.
 - acute 693f.
 - chronic toxicity–, carcinogenicity 694f.
 - irritation of skin and mucous membrane 693
 - mutagenicity 694
 - polychlorobiphenyls (PCB) 689f.
 - polychlorinated dioxins/furans (“dioxins”) 689
 - toys 687
 - transmission geometry 44
 - transition 11
 - transition dipole moments 40
 - transparency 61f., 126ff., 259
 - of coatings 58
 - of plastics 176
 - of prints 260
 - transparency number 129
 - triarylcarbonium pigments 10, 613ff.
 - inner salt of sulfonic acids 614ff.
 - dye salts with complex anions 622ff.
 - triboelectric properties 155
 - tropics test 64
 - Turkey Red 544
- u**
- ultimate tinctorial strength 89
 - ultimate viscosity 112, 141
 - ultrasound dispersion 27
 - ultratransparency 127
 - ultraviolet-cured printing inks 154
 - ultraviolet light curing systems 158
 - USA CONEG regulation 686
- v**
- van der Waals interactions 38, 231, 441
 - vat dyes as pigments 487ff.
 - vat fastness 67
 - Vat Red 14 512ff.
 - Vat Yellow 20 547
 - violanthrone pigments 567
 - Victoria Blue 626, 632
 - viscoelastic properties 114f.
 - viscose 183
 - rayon 67
 - spin dyeing 181f.
 - viscosity 111

- measurement 87ff.
- volume or mass distribution 36
- vulcanization 177

w

- washburn equation 81
- wastewater 691
- water colors 183
- water-ink equilibrium 259
- water-reducible systems 161
- water, soap, alkali and acids 62
- weatherfastness 17, 94ff., 131ff.
- weathering, chalking 76f.
- Weber rule 127
- wet rubbing 394
- wet spinning 181
- wettability 26
- wetting 80ff.
 - of particle surfaces 80
 - tension 81
 - test methods 87ff.
 - time 81
 - volume 87
- Witt substitution rules 12
- wood coloration 183
- wool scale 152

x

- X-ray powder diffraction 44ff.

y

- yield value 112