

Index

- abiatic acid 63, 76, 145, 354, 355, 356, 358, 359
- abrasion resistance 193, 207, 212, 217, 252, 292, 293, 366
- accelerator 84, 91
- acetal, cyclic 300
- acetaldehyde 102, 128, 168, 298
- acetalization 300
- acetone-formaldehyde resins 162
- acetone process 195
- acetophenone-formaldehyde resins 164f, 167
- acetylcellulose – see cellulose acetate
- acidolysis process 67
- acrylamide 280, 303
- acrylates 53, 108, 116, 119, 149, 164, 168, 285 (see also polyacrylates)
- acrylic acid 198, 280, 292, 303, 310, 359, 365, 384, 389
- acrylic esters 278, 280, 292, 296, 297, 298, 303, 313, 359, 361, 389
- acrylonitril 243, 278, 294, 303, 310, 359
- activation energy 270, 273, 338
- adamantane 127
- addition polymerization 1, 2, 4, 7, 14, 101, 231, 269ff, 270, 372
 - , kinetics 15, 283
 - , theory 12
- additives 205, 291, 329, 333, 353, 373, 379f, 386 (see also agents)
 - , analysis 403, 404, 407, 408
 - , hammer finish 393
 - , thixotropic 89, 361
- adhesion 47, 55, 116, 150, 153, 167, 170, 175, 214, 223, 249, 250, 251, 254, 257, 260, 264, 277, 289, 293, 294, 296, 297, 301, 332, 340, 360, 369, 372, 373
- adhesion promoter 89, 150, 289, 302, 357
- adhesives 58, 111, 141, 153, 155, 161, 162, 164, 167, 168, 217, 254, 255, 289, 297, 299, 301, 302, 303, 308, 311, 313, 314, 316, 329, 354, 355, 357, 358, 360, 367, 373, 374
- adipic acid 49, 62, 82, 199
- Advancement Process 228, 251
- AED 402
- agents
 - , anti-blocking 393, 394
 - , anti-floating 393
 - , anti-foaming 329
 - , antissettling 303
 - , anti-skinning 376
 - , blocking 191, 192
 - , coalescence 36, 379
 - , cyclizing 342
 - , dispersing 379, 384
 - , flow 168, 393
 - , levelling 150, 329, 379, 393, 395
 - , mar resistance 379, 393
 - , matting 95
 - , parting 328
 - , release 329
 - , slip 379, 393, 395
 - , water repellent 328
 - , wetting 308, 376, 379, 381, 384, 395
- agglomerates 380, 381
- aggregates 380, 381
- AIBN 270
- aircraft finishes 58, 209, 369, 374
- alcoholysis 362, 365
- aldehyde resins 45, 159ff, 166, 168ff, 349, 405
- aldol condensation 130, 160
- alginates 353
- alkyd oil 61
- alkyds – see alkyd resins
- alkyd resins 31, 45, 60 f, 108, 112, 116, 138, 143, 144, 145, 146, 148, 149, 150, 151, 152, 164, 165, 168, 170, 175, 200, 213, 254, 259, 293, 297, 301, 305, 309, 310, 333, 334, 343, 344, 346, 349, 350, 353, 358, 360, 362, 363, 365, 366, 387, 390
 - , acrylized 73
 - , analysis 398, 401, 406, 414, 415
 - , applications 61
 - , aqueous 70, 77
 - , compatibility 71
 - , cyclides 76
 - , classification 61
 - , drying 61, 71
 - , epoxy 76
 - , functionality 70
 - , high-solids 78
 - , long oil 61, 74
 - , maleic 76
 - , manufacture 66, 67, 68, 69
 - , medium oil 61, 108, 116, 119
 - , metal-reinforced 75
 - , monomers for 62
 - , –, carboxylic acids 62, 63
 - , –, oils 64
 - , –, polyalcohols 64
 - , non-drying 61
 - , oil free 45 – see polyesters, saturated
 - , phenolic 76
 - , plasticization 72
 - , production 66, 67 (see also manufacture)
 - , properties 71

- , resin modified 76
- , short oil 61, 108, 116, 119
- , silicone modified 74
- , styrenized 72, 73
- , testing 422, 426
- , thixotropic 74
- , urethane 74, 193, 194
- , uses 71
- , viscosity 72
- , water-thinnable 77
- alkylenediamines 246
- alkylphenol 124, 125, 147, 152, 243
- alkylphenol resins 123, 136, 152, 153, 260
- , –, dispersion 153
- alkyl silicates 339, 340f, 341 (see also silicates)
- allophanate 179, 188
- allyl compounds 83, 86, 87, 88, 139, 142, 154, 225, 226, 285
- Alukones 75
- amber 148, 347
- amidines 265
- amines (see also diamines, polyamines)
- , aminomethylpropanol AMP 77
- , ammonia 77
- , dimethylaminomethylpropanol DMAMP 77
- , dimethylethanolamine DMEA 77
- , triethylamine 77
- N-aminoethylpiperazine NAEP 245, 246
- aminomethylpropanol AMP 77
- aminoplast resins 109 (see also amino resins, melamine-formaldehyde resins, urea resins)
- aminoplastics – see amino resins, melamine-formaldehyde resins, urea resins
- amino resins 45, 47, 48, 54, 102ff, 262 (see also melamin-formaldehyde resins, urea resins)
- , catalysts 106, 114
- , crosslinking 103
- , flexibility 108
- , hardness 108
- , light stability 108
- , scratch resistance 108
- , starting materials 102
- , –, amino compounds 102
- , –, carbonyl compounds 102
- , weather stability 108
- ammonia 77
- AMP 77
- analysis 395f
- , attenuated total reflection spectroscopy ATR 414, 415
- , cold checking 352
- , cross-polarization/magic-angle spinning CP/MAS 410
- , Curie point pyrolysis 397, 401
- , differential scanning calorimetry DSC 419, 420
- , differential thermal analysis DTA 419
- , dilatometry 419
- , electron excitation spectroscopy 418
- , fast atom bombardment FAB 417
- , Fourier Transform Infrared Spectroscopy FT-IR 396, 413f, 414, 415, 419, 420
- , gas chromatography GC 396f, 398, 408, 415
- , –, DI/MS (direct injection-mass spectrometry) 401
- , –, GC/FT-IR coupling 396
- , –, GC/MS coupling 396, 397, 399, 401, 405, 417
- , –, headspace gas chromatography 397, 401, 402
- , –, inverse gas chromatography 397, 402
- , –, pyrolysis gas chromatography 397, 400, 401, 402
- , gel permeation chromatography GPC 27, 188, 228, 229, 396, 404, 405f, 406, 407, 410
- , –, GPC/FT-IR coupling 407
- , high-performance liquid chromatography HPLC 396, 401, 403f, 408, 417
- , –, normal-phase HPLC 403, 404
- , –, reversed-phase HPLC 403, 404, 405
- , high-performance size exclusion chromatography HPSEC 404
- , infrared spectroscopy IR 89, 292, 409, 410, 412, 413, 414, 415
- , mass spectrometry MS 404, 408, 409, 416f, 417, 419, 420
- , molecular weight distribution 1, 16, 23, 26, 27, 274, 309
- , nuclear magnetic resonance spectroscopy NMR 89, 105, 106, 114, 116, 292, 401, 409f, 410
- , –, ¹³C-NMR spectroscopy 112, 116, 409, 410, 411, 412, 413
- , –, CP/MAS-NMR spectroscopy 411, 412
- , –, ¹H-NMR spectroscopy 110, 116, 409, 412
- , –, ¹⁵N-CP/MAS-NMR spectroscopy 411
- , photoacoustic FT-IR spectroscopy 416
- , polarography 89
- , raman spectroscopy 89
- , secondary ion mass spectrometry SIMS 417
- , sequence analysis 412
- , size exclusion chromatography SEC 104, 405
- , supercriticalfluid chromatography SFC 396, 407f, 408, 417
- , supercriticalfluid extraction SFE 408
- , thermogravimetric analysis TGA 330, 419, 420
- , thermomechanical analysis TMA 419, 421
- , torsional vibration analysis 419
- , ultraviolet spectroscopy UV 409, 418
- , UV-VIS spectroscopy 418
- , X-ray fluorescence spectroscopy 418
- , X-ray photoelectron spectroscopy XPS 418
- animal oil 66
- anti-graffiti coatings 210
- applications 40
- , of epoxy resins 249f, 253f, 255f, 264f
- , of polyesters, saturated 57f
- , of polyisocyanates 205f, 209f
- , of UF resins 104
- , principles 40f
- APS 270
- aramids 173
- architectural paints 311, 334, 335

- array detector 417
 arylphenol 126
 aspartates 202, 203
 atomic emission detector AED 402
 ATR 414, 415
 attenuated total reflection spectroscopy ATR 414, 415
 attraction forces 382
 –, electrostatic 382
 –, hydrogen bonding 131, 133, 174, 175, 192, 193, 207, 208, 382, 385
 –, London-van der Waals forces 382, 385
 –, polymer bridging 382
 automotive components 144, 352, 369
 –, finishes 57, 61, 117, 209, 212, 213, 215, 216, 217, 309
 –, industry 250, 259
 –, primers 151, 212
 –, underbody protection 201, 217, 291, 312, 313
 autoxidation 87
 azelaic acid 49, 62
 azeotropic process 51
 aziridine 196, 308
 azobisisobutyronitrile AIBN 270
- BAC 245, 246
 Bakelite resin 123
 baking 24, 43 (see also crosslinking, curing, stoving)
 ball points pastes 147, 161, 167
 BAPA 245
 base coats 352
 BASF process 110
 BDA 244
 bead polymerization 283, 309
 benzoguanamine resins 119, 252, 260, 265
 benzoic acid 49, 63
 benzophenonetetracarboxylic acid 369
 benzpinacol 270
 benzylaminopropylamine BAPA 245
 benzyltrimethylamine 244
 binders 2, 8, 128 (see also polymers)
 biocides 379
 bio-stability 389, 390
 bis-amino-cyclohexylmethane PACM 201, 245, 246, 247
 bis-aminomethyl-cyclohexane BAC 245, 246
 bis-aminomethyl-cyclohexylmethane DM-PACM 201, 246, 247
 bis-aminomethyl-dicyclopentadiene TCD-diamine 245
 bis(hydroxymethyl)-dihydroxy-2-imidazolidone DMDHEU 107
 bis-oxazolidines 202
 bisphenol A 101, 124, 126, 128, 129, 147, 148, 153, 225, 226, 227, 230, 237, 251, 252, 253, 254, 255, 258, 259, 260, 262, 266
 –, bis-hydroxyethyl ether 49, 50
 –, diallylether 225
 –, diglycidylether BADGE 226, 234, 236, 244, 251, 415
 –, epoxy resins 237
 –, –, analysis 402, 404, 415
 bisphenol F 126, 129, 238, 251, 255, 258, 404
 –, diglycidylether 404
 bitumen 344, 358
 biuret 178, 186, 187, 188, 190
 block polymerization 280
 blown oil 361, 363f
 bodied oil 361
 Boltzmann distribution 409
 BPO 270
 branching 4, 8, 9, 10, 23, 46, 295
 –, coefficient 9
 –, degree of 9
 –, unit 11
 building conservation 328, 336, 337
 bulk polymerization 279, 280, 282, 295, 303, 309, 373
 butadiene 278, 310, 311, 312
 butane diol 49, 82, 199
 butanedioletherdiamine BDA 244
 butene 278
 butyl acrylate 198
tert-butyl benzoic acid 49, 63
tert-butyl isophthalic acid 49, 50
 butylphenol 129, 140
 butyl rubber 290
- cable sheathings 287, 289
 can-coatings 57, 143, 252, 253, 254, 259, 260, 261, 265, 295, 309, 313
 carbamic acid 178
 carbamic acid ester 178, 354
 carbamide resin 349
 carbodiimids 179
 carboxymethylcellulose CMC 348, 353, 388
 cardanol 124, 126, 129
 cardol 124, 126, 129
 Cardura resins 77
 cashew nut oil 124, 144
 castor oil 65, 259, 361, 363
 catalysis 180
 –, general acid 104, 113
 –, general base 105
 –, phase transfer 228
 –, specific acid 112
 catalysts 47, 48, 90, 106, 114, 130, 133, 140, 142, 147, 150, 151, 159, 167, 180, 191, 204, 205, 217, 225, 323, 327, 329, 330, 337, 338, 355, 356, 360, 364, 372, 376
 –, acids 142, 144, 275, 327
 –, amines 180, 242, 252
 –, ammonium salts 180
 –, bases 327, 338
 –, boron trifluorid 242, 252
 –, DABCO 180, 191
 –, dibutyltin dilaurate DBTL 180, 191
 –, Friedel-Crafts 275, 314
 –, imidazole 242, 252, 258
 –, Lewis acids 230, 274, 275
 –, metal 180

- , metal chelates 327, 338
- , metal salts 180, 191, 327, 338
- , organometallic compounds 180, 338
- , phenols 180
- , phosphines 180
- , phosphoric acid esters 338
- , Ziegler-Natta 20, 276, 279, 286, 310, 313
- cellulose 348, 349
- cellulose 347, 348, 352, 388
- cellulose acetate 31, 162, 348, 350f, 351, 423
- , cellulose triacetate 351
- cellulose acetate butyrate CAB 31, 170, 348, 351, 352, 400, 423
- cellulose acetate propionate CAP 348, 351, 423
- cellulose butyrate 348
- cellulose derivatives 197, 200, 296, 340, 348f, 379
- cellulose esters 348f, 426
- cellulose ethers 162, 302, 315, 334, 352f, 389, 426
- cellulose nitrate 31, 95, 162, 165, 167, 168, 170, 175, 205, 293, 297, 302, 311, 348f, 349, 350, 351, 353, 358
- , analysis 407, 415
- , A-type 349 (alcohol-soluble)
- , AM-type 349
- , emulsions 350
- , E-type 349 (ester-soluble)
- , testing 422, 426
- cellulose propionate 348
- chain 8, 13, 29, 174, 271
- , branched 23, 295
- , crosslinked 23
- , growth 17, 19, 269, 270
- , kinetic length 11, 16, 274
- , linear 23
- , radical 272
- , stereochemistry 24
- , structure 23, 24
- , termination 13, 14, 15, 129, 271, 272, 273, 295, 325
- , transfer 14, 15, 16, 272, 295
- , –, constant 272
- chemical resistance 189, 193, 207, 210, 211, 213, 214, 217, 223, 243, 248, 250, 251, 252, 254, 260, 263, 288, 293, 294, 305, 330, 369, 370, 371, 372, 373
- chemical shift 106, 115, 409
- Chemie Linz process 110
- chlorinated oil 362
- chlorinated polyethylene 288, 342, 343
- chlorinated rubber 151, 165, 170, 289, 296, 297, 313, 315, 342, 343f, 344, 358, 362, 372, 422
- chlorination 343
- , chloropren 344
- chlorosulphonated polyethylene 287f, 344
- , elasticity 287
- , weather resistance 287
- chroman ring 144, 148, 152, 153
- CHP 270
- circulation process 69
- citraconic acid 82, 363
- clear coats 212
- CMC 348, 353, 388
- coatings 12, 28, 33 (see also processing)
- , air-drying 190, 203, 210, 253, 259, 265, 362
- , can-coatings 57, 143, 252, 253, 254, 259, 260, 261, 265, 295, 309, 313
- , coil-coatings 57, 150, 213, 215, 253, 295, 309, 333, 334
- , decorative coatings 210, 256, 310, 366
- , DIY coatings 61, 210
- , environment-friendly 34
- , force-drying 190, 203, 206
- , furniture coatings 61, 81, 90, 108, 146, 210, 216, 264, 265, 308, 350
- , high-solids 34, 55, 56, 78, 139, 190, 201, 203, 205, 209, 210, 211, 248, 309, 315, 343
- , industrial coatings 58, 117, 141, 210, 215, 254, 260, 287, 308, 343
- , moisture-curing 189, 190, 211, 211, 218
- , multicomponent 40, 42
- , noise-damping coatings 217
- , one-pack 189, 192, 211f, 214, 218, 340, 341
- , packaging coatings 139, 143, 149, 151, 175, 213, 260, 265, 293, 294, 314
- , powder 38, 40, 42, 43, 47, 49, 54, 55, 56, 58, 87, 150, 151, 161, 168, 174, 185, 189, 218, 251, 252, 253, 259, 262f, 263, 264, 265, 287, 291, 295, 301, 311, 369, 370, 371, 372
- , radiation curable 43, 54, 55, 56, 84, 91, 95, 161, 218, 242, 252, 254, 264, 309, 327, 346, 352, 371
- , repair coatings 81, 91, 253, 309
- , solvent-borne 55, 209, 257, 259, 265, 382, 384
- , solvent-free 190, 203, 217, 255
- , stoving 4, 24, 43, 61, 143, 150, 207, 209, 210, 212, 213, 215, 218, 259, 260, 265, 309, 313, 329, 350, 353, 368, 370
- , two-pack 12, 42, 95, 162, 185, 200, 203, 294, 205, 206, 209, 210, 215, 216, 217, 249, 250, 253, 258, 265, 309, 340, 341, 346
- , water-borne 52, 55, 56, 83, 117, 140, 123, 150, 154, 174, 176, 190, 214, 215, 216, 248, 258, 261, 297, 303, 309, 345, 352, 258, 261, 360, 364, 380, 382, 384, 388, 390
- , weatherstable 190, 203
- , wood coatings 58, 81, 90, 103, 142, 168, 214, 265, 297, 298, 308, 311, 334, 346, 350, 352, 353, 354, 360, 364, 366
- co-condensation 331
- coconut oil 61, 65, 66, 259, 361
- coil-coating 57, 150, 213, 215, 253, 295, 309, 333, 334
- cold checking 352
- colloids 281, 295, 298, 299, 303, 308, 353, 373
- colophony – see rosin
- commercial products
- , acetophenone-formaldehyde resins 167, 168
- , additives 205
- , aldehyde-formaldehyde resins 169
- , alkyl resins 78

- commercial products
 - , alkylphenol resin dispersions 153
 - , alkylphenol resins 153
 - , bis-oxazolidine 202
 - , cellulose acetate 351
 - , cellulose acetate butyrate 352
 - , cellulose acetate propionate 352
 - , cellulose ether 353
 - , cellulose nitrate 350
 - , chlorinated polyethylen-vinyl acetate copolymer 345
 - , chlorinated polypropylene 245
 - , chlorinated rubber 344
 - , cyclized rubber 343
 - , cyclohexanone resins 163
 - , cyclohexanone-formaldehyde resins 164
 - , diamines, blocked 201
 - , diisocyanates 182, 183, 184
 - , epoxy resins 242
 - , ethyl silicate 341
 - , hydrocarbon resins 170, 315
 - , maleic resins 360
 - , melamine-formaldehyde resins 118
 - , monoisocyanates 184
 - , novolaks 147
 - , –, epoxy 147
 - , oils 363
 - , –, blown oil 363
 - , –, isomerized oil 363
 - , –, maleinized 364
 - , –, stand oil 363
 - , –, urethane oil 366
 - , oligobutadienes 346
 - , phenol ether resins 139
 - , polyacrylates 198, 307
 - , polyamides 176
 - , polyamines 250
 - , polycarbonates 102, 199
 - , polychlorotrifluoroethylene 288
 - , polyesters, saturated 59, 198
 - , polyethers 200, 371
 - , polyethylene 287
 - , –, chlorosulphonated 287
 - , polyisobutylene 290
 - , polyisocyanates 185, 186, 187, 188, 189
 - , –, blocked 191
 - , –, prepolymers 190
 - , polylactones 199
 - , polyolefins, chlorinated 289
 - , polyols 198, 199
 - , polyphenylenes 372
 - , polyphenylene sulphides 368
 - , polyspiran resins 371
 - , polystyrene copolymers 311
 - , polysulphides 267
 - , polysulphones 369
 - , polytetrafluoroethylene 288
 - , polyurethane resins 191, 193
 - , –, alkyds 194
 - , –, dispersions 195
 - , –, oils 194
 - , –, polyurethane resins, thickeners 197
 - , polyvinyl alcohol 299
 - , polyvinyl butyral 301
 - , polyvinyl chloride 291
 - , –, copolymers 293
 - , –, postchlorinated 292
 - , polyvinylesters 296
 - , polyvinylether 302
 - , polyvinylidene chloride 294
 - , polyvinylidene fluoride 295
 - , polyvinyl formal 301
 - , polyvinylpyrrolidone 303
 - , resols, alcohol-soluble 142
 - , resols, cold-curing 142
 - , resols, etherified 143
 - , resols, plasticized 144
 - , resols, watersoluble 141
 - , rosin 356, 357
 - , rosin esters 358
 - , rosin-modified phenolic resins 150
 - , rosin salts 358
 - , silicone resins 338
 - , styrene-butadiene copolymer dispersions 312
 - , sucrose acetate isobutyrate 354
 - , terpene phenolic resin 155
 - , UP resins 96
 - , urea-formaldehyde resins 108
 - , water glass 340
- compatibility 30, 45, 50, 51, 71, 119, 143, 164, 166, 168, 169, 175, 257, 289, 291, 293, 296, 297, 301, 302, 303, 304, 310, 328, 344, 351, 353, 358, 380, 393, 394
- complex-coordinate mechanism 345
- condensation 11, 132, 134, 135, 137, 327
 - , acidic 137
 - , alkaline 138
 - , with ammonia 138
- configuration 25 (see also linking, microstructure, stereochemistry)
 - , cis-trans 25, 312, 345
- conjugen oil 362, 365
- copal 148, 347, 358
- copolyamides 174
- copolymers 18, 20, 165, 167, 168, 277, 290f, 292, 293, 302, 311, 344, 372, 401
 - , alternating 19
 - , analysis 404
 - , block 19
 - , graft 19, 364
 - , random 19
- copolymerization 18, 19, 81, 83, 84, 85, 276f, 292
 - , graft copolymerisation 291, 364
 - , kinetics of 19
 - , parameter of 19, 20
- co-reactants 185, 197ff, 203
- corrosion protection 141, 144, 149, 151, 152, 153, 174, 206, 210, 212, 217, 223, 250, 253, 260, 265, 288, 290, 292, 293, 295, 301, 302, 308, 311, 313, 328, 334, 343, 368, 371, 372, 376

- cotton 347
- , collodium cotton 348 (see also cellulose nitrate)
- , guncotton 348 (see also cellulose nitrate)
- , nitrocotton 348 (see also cellulose nitrate)
- cotton seed oil 65, 361
- Coulombs law 382
- coumarone 315
- coumarone-indene resin 241, 243, 285, 314, 315f, 316
- CP/MAS 410
- CPVC 291, 292
- cresol 124, 129
- cresol-novolak glycidylether 239, 263
- crystallinity 27, 174, 175, 276, 286, 288, 289, 294, 397
- cross-polarization/magic-angle spinning CP/MAS 410
- crosslinker 45, 47, 48, 49, 54, 142, 216, 217, 257
- crosslinking 4, 8, 9, 23, 28, 33, 47, 48, 49, 83, 85, 101, 103, 108, 112, 115, 116, 129, 133, 137, 139, 141, 144, 146, 151, 152, 174, 191, 196, 202, 207, 215, 216, 222, 233, 234, 236, 237, 252, 255, 264, 265, 287, 291, 299, 304, 305, 306ff, 307, 309, 311, 324, 325, 326, 327, 328, 329, 330, 331, 342, 346, 415 (see also curing)
 - , analysis 415, 416
 - , auto 48, 110, 113, 139, 144, 305, 306, 415
 - , by condensation 327
 - , density 54
 - , with diamines 305
 - , with dicyanodiamide 233
 - , external 48, 305, 306
 - , overcrosslinking 204
 - , oxidative 313, 346, 361
 - , with metal complexes 305
 - , with peroxide 327, 342
 - , physical 192
 - , by polymerization 234
 - , by radiation 43, 54, 55, 56, 84, 91, 95, 161, 218, 242, 252, 254, 264, 265, 309, 327, 346, 352, 371
 - , self- 48, 110, 113, 139, 144, 305, 306
 - , with styrene 85
 - , thermal 313
 - , undercrosslinking 204
- crotonic acid 292, 296, 297
- cumene hydroperoxide CHP 270
- Curie point pyrolysis 397, 401
- curing 12, 23, 40, 43, 84, 90, 106, 113, 134, 136, 139, 141, 142, 144, 178, 206, 243, 248, 249, 259, 326, 328, 329, 340 (see also crosslinking, drying)
 - , accelerators 244
 - , acids 108, 117, 142, 144
 - , agents 4, 12, 142, 222, 236, 242f, 244f, 248, 253, 263, 290
 - , –, amino resins 102ff, 252
 - , –, anhydrides 251, 263
 - , –, carboxylic acids 49, 82, 251, 254, 261
 - , –, agents, diamines 242, 244ff, 263
 - , –, diphenols 251
 - , –, mercaptans 251
 - , –, phenolic resins 123f, 252, 263
 - , –, polyamines 242ff
 - , –, polyisocyanates 177f, 184, 251
 - , –, polyphenols 251, 252
 - , air-drying 86, 362
 - , ambient 255
 - , cold 108, 142
 - , electron beams 43, 95, 264, 265, 371
 - , heat 4, 24, 43, 61, 141, 143, 150, 207, 209, 210, 212, 213, 215, 218, 259, 260, 265, 309, 313, 329, 350, 353, 368, 370
 - , high-frequency field 44
 - , infrared 43
 - , inhibition 84, 85
 - , microwaves 43
 - , moisture 189, 218
 - , radiation 43, 54, 55, 56, 84, 91, 95, 161, 218, 242, 252, 254, 264, 309, 327, 346, 352, 371
 - , self-curing 48, 110, 113, 139, 144, 305, 306
 - , ultraviolet UV 43, 84, 91, 94, 95, 152, 242, 252, 254, 264, 265, 350
- cyanamide resins 119, 120
- cyclides 76
- cyclization 342, 343
- cyclized rubber 342f
- cyclodisilazane 375
- cyclohexane dicarboxylic acid 50
- cyclohexane dimethanol 49, 50
- cyclohexanone resins 163
- cyclohexanone-formaldehyde resins 163f
- cyclohexylaminopropylamine NAPCHA 245
- cyclo oil 361, 365
- cyclopentadiene 365
- cyclotrimerization 376

- DABCO 180, 191
- DAC 245, 246, 247
- dammar 347
- DAMP 245
- DBP 270
- DBTL 180, 191
- DCH 245, 246, 247
- DDM 245, 247, 256, 369, 415
- DDS 245, 247
- decane dicarboxylic acid 49, 50
- decarboxylation 356
- decorative coatings 210, 256, 310, 366
- DEDDM 245
- deflocculation 381
- defoamers 379, 393
- degradation 343, 358
- degree
 - of acetalization 300
 - of branching 9
 - of conversation 5, 7, 10, 17, 18,
 - of esterification 351, 412
 - of polymerization 5, 6, 7, 10, 16, 272, 274, 275
- dehydroabietic acid 354, 355, 356

- dehydrated castor oil 61, 65, 361, 363, 370
 dehydration 361
 dehydrogenation 355, 356, 361
 dehydrohalogenation 230
 depolymerization 341, 342, 343
 DETA 244, 245
 DETDA 245
 detectors
 –, array 417
 –, atomic emission AED 402
 –, concentration 403
 –, FID 396, 397, 498
 –, IR 405, 407
 –, UV 403, 405, 407
 dextrans 353
 diamines 194, 200, 235, 237, 242, 243, 244f,
 263, 305, 369 (see also polyamines)
 –, N-Aminoethylpiperazine NAEP 245, 246
 –, benzylaminopropylamine BAPA 245
 –, bis-amino-cyclohexylmethane PACM 201,
 245, 246, 247
 –, bis-aminomethyl-cyclohexane BAC 245, 246
 –, bis-aminomethyl-cyclohexylmethane DM-
 PACM 201, 246, 247
 –, bis-aminomethyl-dicyclopentadiene TCD-dia-
 mine 245
 –, blocked 200, 201
 –, butanedioletherdiamine BDA 244
 –, cyclohexylaminopropylamine NAPCHA 245
 –, diaminocyclohexane DAC, DCH 245, 246,
 247
 –, diaminodiphenylmethane DDM 245, 247, 256,
 369, 415
 –, diaminodiphenylsulfone DDS 245, 247
 –, dicyanodiamide DICY 245, 263, 265
 –, diethylaminodiphenylmethane DEDDM 245
 –, diethyltoluenediamine DETDA 245
 –, dimethyldiamino-dicyclohexylmethane 245
 –, ethylenediamine EDA 244, 245
 –, hexamethylenediamine HMDA 246
 –, isophorone diamine IPD 201, 245, 246, 247
 –, methylpentamethylenediamine MPMDA 245,
 246
 –, pentanediamine DAMP 245
 –, polyoxyethylenediamine PEGDA 244
 –, polyoxypropylenediamine PPGDA 244
 –, polytetrahydrofurandiamine PTHFDA 244
 –, propylenediamine PDA 245
 –, tricyclododecandiamine TCD 246
 –, trimethylhexamethylenediamine TMD 245, 246
 –, m-xylylenediamine MXDA 245, 247
 diaminocyclohexane DAC, DCH 245, 246, 247
 diaminodiphenylmethane DDM 245, 247, 256,
 369, 415
 diaminodiphenylsulfone DDS 245, 247
 diammonium persulfate APS 270
 dibenzoyl peroxide BPO 270
 dibenzyl ether 131, 132, 135
 dibutyltin dilaurate DBTL 180, 191
 dicumene peroxide Dicup 270
 Dicup 270
 DICY 109, 119, 233, 245, 263, 265
 dicyanodiamide DICY 109, 119, 233, 245, 263,
 265
 dicyclohexylmethane diisocyanate H₁₂MDI 181,
 183, 219, 391
 Diels-Alder reaction 175, 355, 358, 362, 363,
 364, 365
 diethylaminodiphenylmethane DEDDM 245
 diethylene glycol 49, 82, 199
 diethylenetriamine DETA 244, 245
 diethylenetriaminomethyl-phenol 244
 diethyltoluenediamine DETDA 245
 dihydrazides 308
 dihydroabietic acid 355, 356
 diisocyanate 165, 167, 177, 180, 181, 189, 192,
 196, 197, 211, 218, 219, 365, 366, 369, 373,
 391
 –, aliphatic 181, 182f
 –, aromatic 181f
 –, cycloaliphatic 188
 –, dicyclohexylmethane diisocyanate H₁₂MDI
 181, 183, 219, 391
 –, diphenylmethane diisocyanate MDI 181, 182,
 211, 220, 408, 411
 –, hexamethylene diisocyanate HDI 181, 182f,
 186, 211, 220
 –, isocyanatomethyl methylcyclohexyl isocyanate
 IMCI 219
 –, isophorone diisocyanate IPDI 178, 183, 211,
 219, 346, 391
 –, testing 426
 –, tetramethylxylylene diisocyanate TMXDI 183
 –, toluene diisocyanate TDI 181, 186, 211, 219,
 251, 391, 404, 408
 –, trimethylhexamethylene diisocyanate TMDI
 181, 184
 –, xylylene diisocyanate XDI 181, 183
 differential scanning calorimetry DSC 419, 420
 differential thermal analysis DTA 28, 419
 dilatometry 419
 dimer fatty acid 49, 50, 63, 87, 174, 175, 243
 dimerization 180
 dimethylamino-methylphenol 244
 dimethylaminomethylpropanol DMAMP 77
 dimethylaniline 244
 dimethyldiamino-dicyclohexylmethane 245
 dimethyleneamine linkage 134
 dimethylene ether bridge 130, 132, 133, 134,
 136, 138, 153, 410
 dimethylethanolamine DMEA 77
 dimethylol-phenol 130
 dimethylol propionic acid 49
 DI/MS (direct injection-mass spectrometry) 401
 dioxazoline 370
 diphenol 126, 251
 diphenolic acid 140
 diphenylmethane 131, 132
 diphenylmethane diisocyanate MDI 181, 182,
 211, 220, 408, 411
 1, 3-dipolar addition 372
 dipotassium persulfate KPS 270

- dipropylene glycol 82
- dipropylenetriamine DPTA 245
- disaccharides 353
- dispersants 380
- dispersing process 380, 381, 386
 - , stabilization 381, 382, 383, 385
- dispersions 35, 36, 37, 153, 194, 195, 196, 197, 200, 207, 214, 215, 285, 287, 288, 293, 294, 295, 296, 297, 298, 299, 311, 340
 - , aqueous 35, 55, 56, 141, 215, 288, 299, 307f, 308, 371
 - , ionomer 194
 - , mechanical 381
 - , medium fine 298
 - , non aqueous, NAD 38, 153, 371, 384
 - , primary 35
 - , secondary 308
 - , testing 426
 - , UV-curing 350
- disproportionation 13, 14, 15, 16, 202, 356
- dissociation 384
- distributor 281
- ditacticity 24
- di-*tert*-butyl peroxide DBP 270
- DIY coatings 210
- DMAMP 77
- DMDHEU 107
- DMEA 77
- DM-PACM 201, 246, 247
- domestic appliances 210, 265, 309, 368, 369
- DPTA 245
- driers 311, 342, 362, 363, 379
- drying 33, 34, 40, 43, 61, 71, 81, 86, 149, 162, 167, 193, 205, 206, 259, 310, 329, 360, 361, 362, 363, 365, 366, 387
 - , air-drying 86, 190, 203, 210, 253, 259, 265, 362
 - , chemically 33, 34, 43
 - , force drying 43, 190, 206
 - , inductive 44
 - , oven 108
 - , oxidative 311, 346, 364
 - , physical 33, 34, 43, 95, 146, 206, 207, 214, 344
 - , rate 212
 - , semi-drying 361, 365
 - , spray drying 309
- DSC 419, 420
- DSM-Stamicarbon process 110
- DTA 28, 419

- EDA 244, 245
- EHEC 388
- elastomers 192, 193, 214, 254, 302, 314, 324, 367
- electrical double layer 382, 383
- electrical insulating 141, 143, 146, 147, 213, 316, 328, 336, 338, 343, 346, 353, 370, 372, 374, 376
- electrodeposition 40, 139, 141, 143, 151, 193, 214, 215, 262, 313

- electron excitation spectroscopy 418
- electronic equipments 210, 250, 328, 369
- electrophilic substitution 128
- elemi 347
- emulsifier 281, 284, 298, 350, 356
 - , Pickering emulsifier 281, 282
- emulsion polymerization 279, 280, 283f, 284, 288, 294, 295, 303, 350
- emulsions 298, 303, 310, 337, 346, 350, 353, 387, 389, 392
 - ene reaction 345, 363, 364
- EPDM 289
- epichlorohydrin 224, 226, 229, 230
- epoxidation 225, 361, 362
- epoxide adducts 247
- epoxidized oil 361
- epoxy compounds 223
 - , addition 232
 - , –, of amines 233, 242ff
 - , –, of anhydrides 231
 - , –, of carboxylic acids 231
 - , –, of mercaptans 233, 251
 - , –, of phenol 230, 231, 233
 - , chemistry of 223ff
 - , industrial syntheses 224
 - , reactions 231
- epoxy esters 259, 260, 333, 343, 363
- epoxy novolaks 147, 154, 255, 257, 258
- epoxy phenolic resins 150, 251, 252
 - , precondensates 150
- epoxy resins 31, 47, 49, 54, 108, 116, 119, 142, 143, 144, 147, 148, 150, 151, 164, 200, 201, 222ff, 226, 234, 237, 242, 243, 249, 253, 254, 259, 261, 266, 290, 293, 301, 305, 315, 333, 334, 336, 344, 349, 351, 354, 367, 371, 373 (see also bisphenol A, bisphenol F, novolaks, resols)
 - , abrasion resistance 252
 - , accelerators 244, 252
 - , –, benzyltrimethylamine 244
 - , –, diethylenetriaminomethyl-phenol 244
 - , –, dimethylaminomethyl-phenol 244
 - , –, dimethylaniline 244
 - , –, tris-(dimethylaminomethyl)phenol 244
 - , adhesion 223, 249, 250, 251, 254, 257, 260, 264
 - , analysis 398, 402, 404, 412
 - , application 249f, 264f
 - , bisphenol A 237, 251, 252, 253, 254, 255, 258, 259, 260, 262, 266
 - , bisphenol F 238, 255, 258, 404
 - , building blocks 253ff
 - , –, reaction with acrylic acid 254
 - , –, reaction with fatty acids 254
 - , –, reaction with methacrylic acid 254
 - , –, reaction with polycarboxylic acids 254
 - , chemical resistance 223, 243, 248, 250, 251, 252, 254, 260, 263
 - , coatings 249
 - , –, air drying 259
 - , –, powder 262ff

- epoxy resins
 –, –, solvent-based 257, 259
 –, –, solvent-free 255
 –, –, water-borne 258, 261
 –, compatibility 257
 –, curing agents 242, 244f, 253, 290
 –, –, amino resins 252
 –, –, anhydrides 251, 263
 –, –, carboxylic acids 251, 254, 261
 –, –, diamines 242, 244ff, 263
 –, –, diphenols 251
 –, –, mercaptans 251
 –, –, phenolic resin 252, 263
 –, –, polyamines 242ff
 –, –, polyisocyanates 251
 –, –, polyphenol 251, 252
 –, cycloaliphatic 236
 –, epoxy equivalent 150, 233, 237, 238, 239
 –, flexibility 243, 249, 250, 251, 252, 254, 255, 256, 257, 260, 263, 264
 –, flexibilizing resin 257
 –, formulations 264
 –, hardness 223, 243, 249, 250, 252, 260, 263
 –, networks 234, 235, 236, 237, 257
 –, pigment wetting 222
 –, prereaction 257
 –, polymerization 252
 –, polyol 208
 –, synthesis 226
 –, testing 422, 426
 e-Q diagram 19, 84
 equilibrium 7, 105, 110, 135, 179, 358
 –, constant 7
 –, of dissociation 274
 esterification 170, 259, 348, 349, 356, 357, 359, 370
 ethenyl group 285, 286
 etherification 107, 111, 117, 170, 360
 ethylcellulose 348, 353f, 423
 ethylene 277, 278, 280, 296, 297
 ethylene bridge 136
 ethylenediamine EDA 244, 245
 ethylene glycol 49, 64, 82, 199, 299, 340, 391
 ethylhexyl acrylate 198
 ethylhydroxyethylcellulose EHEC 388
 ethyl silicate 340, 341
 –, –, ethyl silicate paints 341
 extenders 95, 204, 205, 340, 368, 388
- FAB 417
 factice 361
 fast atom bombardment FAB 417
 fatty acid process 68
 fatty acids 45, 60, 61, 63, 76, 144, 199, 254, 259, 353, 360, 361, 385
 –, dehydrated ricinoleic 361
 –, dimer 49, 50, 63, 87, 174, 175, 243
 –, epoxidized 224
 –, hydroxystearic 361
 –, linoleic 360, 361
 –, linolenic 360, 361
 –, oleic 360, 361
 –, ricinoleic 361
 –, stearic 360, 361
 –, synthetic 60, 61, 62, 68
 –, testing 426
 FID 396, 397, 498
 fillers 149 (see also extenders)
 film formation 33, 35, 37, 38, 139, 248, 313, 352, 379
 filmforming auxiliaries FFA 36
 filmforming temperature MFT 36, 47, 297, 307, 311
 fish oil 347, 361
 flame ionization detector FID 396, 397, 498
 flexibility 47, 50, 55, 108, 116, 142, 143, 150, 151, 175, 193, 207, 210, 214, 218, 243, 249, 250, 251, 252, 254, 255, 256, 257, 260, 263, 264, 289, 292, 293, 301, 304, 309, 310, 332, 343, 351, 353, 366, 421
 flexibilizer 222
 flocculation 380, 381, 383, 384
 floor coverings 212, 217, 253, 254, 256, 291, 293, 376
 flow promotor 95, 168, 333
 foundry binders 147
 Fourier Transform Infrared Spectroscopy FT-IR 396, 413f, 414, 419, 420
 free-radical polymerization 12, 16, 17, 18, 20, 27, 162, 264, 269, 271, 272, 273, 275, 277, 282, 286, 290, 294, 310, 364
 Friedel-Crafts catalyst 275, 314
 FT-IR 396, 413f, 414, 419, 420
 fumaric acid 63, 82, 363
 fumaropimaric acid 359
 functionalization 346
 functionality 5, 8, 9, 10, 11, 45, 47, 53, 70, 119, 128, 130, 136, 137, 208, 222, 324, 327
 furan resins 155f, 368
 furniture coatings 61, 81, 90, 108, 146, 210, 216, 264, 265, 308, 350
- gas chromatography GC 396f, 398, 408, 415
 –, DI/MS (direct injection-mass spectrometry) 401
 –, GC/FT-IR coupling 396
 –, GC/MS coupling 396, 397, 399, 401, 405, 417
 –, headspace gas chromatography 397, 401, 402
 –, inverse gas chromatography 397, 402
 –, pyrolysis gas chromatography 397, 400, 401, 402
 gas phase polymerization 279
 gas stream condensation 51
 GC 396f, 398, 408, 415
 gelatine 281
 gelation 37, 153, 155, 162, 331, 365
 gelchromatography – see gel permeation chromatography
 gelling 4, 91
 –, time of 91
 –, prediction of 11
 gel oils 362

- gel permeation chromatography GPC 27, 188, 228, 229, 396, 404, 405f, 406, 407, 410
 - , GPC/FT-IR coupling 407
- gel point 11
- glass transition temperature 27, 28, 36, 47, 50, 150, 277, 293, 297, 299, 307, 310, 311, 374, 397, 419, 420, 421
- gloss 55, 149, 167, 168, 170, 210, 328, 332, 360, 372, 380, 421
- glycerol 49, 64, 199, 299, 340, 357, 359, 365
- glycidylation 228
 - , of alcohols 228, 230
 - , of amines 229, 242
 - , of carboxylic acids 228, 251
 - , of heterocyclics 228
- glycidyl compounds 225, 226
 - , addition reactions 232
 - , aromatic 240
 - , bromine containing 240
 - , cycloaliphatic 239, 240, 241
 - , crosslinking with dicyanodiamide 233
 - , crosslinking by polymerization 234
 - , diglycidyl compounds 227, 255
 - , heterocyclic 240, 241
 - , tetraglycide 241
 - , triglycidyl compounds 240, 241
- glycidylester 242, 257
- glycidylether 238, 263
 - , aliphatic glycidylether 241, 255, 257
 - , aromatic glycidylether 241, 256
 - , bisphenol A-bis-hydroxyethyl ether 49, 50
 - , –, diglycidylether 226, 234, 236, 251
 - , bisphenol F diglycidylether 404
 - , diglycidylether 227, 248, 260, 261, 266
- glyptal resin 45, 67
- gold finishes 151, 261
- GPC 27, 188, 228, 229, 396, 404, 405f, 406, 407, 410
- grapeseed oil 65
- Grignard synthesis 323
- groundnut oil 65, 66
- guanamine 102, 119
- guanidine 102, 119
- gum rosin 354
- gutta-percha 313
- half-life 13, 270
- HALS (hindered amine light stabilizers) 209, 404
- hardener 4, 142, 222
- hardness 50, 108, 116, 149, 162, 168, 193, 207, 223, 243, 249, 250, 252, 260, 263, 303, 304, 309, 310, 332, 333, 350, 353, 358, 360, 368, 421
 - , Buchholz 421
 - , pencil 421
 - , pendulum 421
- HDI 181, 182f, 186, 211, 220
 - , HDI adduct 187, 188, 190, 217
 - , HDI trimer 187, 188, 190, 216
- HDPE 286
- headspace gas chromatography 397, 401, 402
- heavy transport finishes 58, 61, 209
- HEC 348, 352, 353, 388, 407
- HET acid 89
- HEUR 196
- hexa 127
- hexahydrobenzoic acid 49
- hexahydrophthalic acid 199
- hexahydrophthalic anhydride 49, 50
- hexahydroterephthalic acid 49, 62
- hexamethoxymethylmelamine HMMM 31, 111, 112, 114, 116, 117, 118, 261, 404
- hexamethylene diamine HMDA 246
- hexamethylene diisocyanate HDI 181, 182f, 186, 211, 220
- hexamethylenetetramin 127, 128, 134, 147
- hexane diol 49, 199
- hiding power 167, 380, 389, 390
- high build finishes 216
- high-solids 34, 55, 56, 78, 139, 190, 201, 203, 205, 209, 210, 211, 248, 309, 315, 343
- high-performance liquid chromatography HPLC 396, 401, 403f, 408, 417
 - , normal-phase HPLC 403, 404
 - , reversed-phase HPLC 403, 404, 405
- high-performance size exclusion chromatography HPSEC 404
- high temperature coatings 328, 369, 371
- HMDA 246
- H₁₂MDI 181, 183, 219, 391
- HMMM 31, 111, 112, 114, 116, 117, 118, 261, 404
- homopolyamides 173, 174
- homopolymerization 19, 304, 313
- hot melts 155, 167, 168, 297, 311, 314, 355
- HPLC 396, 401, 403f, 408, 417
- HPMC 388
- HPSEC 404
- hydroabietyl alcohol 358
- hydrocarbon resins 31, 169, 212, 285, 314f, 349
- hydrogenated castor oil 361, 362
- hydrogenation 167, 355
- hydrogen bonding 131, 133, 174, 175, 192, 193, 207, 208, 382, 385
- hydroperoxides 90, 270
- hydrophilicity 304, 305
- hydrophobicity 304, 305
- hydroxyethyl acrylate 198
- hydroxyethylcellulose HEC 348, 352, 353, 388, 407
- hydroxyethyl methacrylate 198
- hydroxypivalic acid neopentyl glycol ester 49
- hydroxypropylcellulose 348, 352, 353
- hydroxypropyl methacrylate 198
- hydroxypropylmethylcellulose HPMC 388
- hydroxystearic acid 361
- IMCI 219
- imidazole 258, 415
- imides, cyclic 370
- impregnation 140, 152, 213, 289, 316, 337, 340, 346, 364, 367

- indene 315
industrial coatings 58, 117, 141, 210, 215, 254, 260, 287, 308, 343
infrared spectroscopy IR 292, 409, 410, 412, 413, 414, 415
inhibition 84, 270
inhibitor 14, 15, 84, 272, 327
–, nitro compound 272
–, quinone 272
initiation 12, 13, 15, 269, 270, 273, 274, 282
initiator 12, 13, 16, 90, 242, 269, 270, 271, 275, 281, 284, 364 (see also photoinitiator)
–, azo compounds 269
–, benzpinacol 270
–, concentration 15
–, decomposition 12, 13, 269, 270, 271
–, electrophilic 275
–, hydroperoxides 270
–, peroxides 269, 270
–, persulphates 269
–, radical 13, 269, 284, 364
–, redox 269, 270, 284
insertion 276
interpolymerization 276 (see also copolymerization)
ionic bonding 385
ionic polymerization 17, 18, 20, 27, 269, 273, 274, 282
–, anionic 273, 275, 278, 279, 280, 310, 345
–, cationic 273, 275, 276, 278, 279, 280, 302, 310, 345, 372
–, living 17, 274, 275, 373
ion pairs 20, 274, 282
–, intimate 282
IPD 201, 245, 246, 247
IPDI 178, 183, 211, 219, 346, 391
–, IPDI trimer 188, 189, 190, 191, 219
IR 292, 409, 410, 412, 413, 414, 415
isobutene 278, 280, 290
isocyanates 184 (see also diisocyanates)
–, aliphatic 180
–, isocyanate-amine process 187
–, monoisocyanates 184
–, reactions of 177ff, 180
isocyanatomethyl methylcyclohexyl isocyanate IMCI 219
isocyanurate 179, 185, 188, 219, 230, 264, 370, 415
isodecanoic acid 63
isolene oil 362, 365
isomerization 342, 356, 361, 362
isomerized oil 361, 362f
isomers 24, 25
isononanoic acid 49, 63
isooctanoic acid 63
isophorone diamine IPD 201, 245, 246, 247
isophorone diisocyanate IPDI 178, 183, 211, 219, 346, 391
isophthalic acid 49, 62, 82, 199, 398
isopimaric acid 354
isoprene 278, 280, 312
isoprene-isobutene copolymer 290
itaconic acid 63, 82, 363
ketone resin 45, 159ff, 166, 204, 349
ketimine 201, 202, 203, 243, 256
ketimine-ketazine process 190
KPS 270
K value 27, 349
laccain 123
lactic acid 63
laevopimaric acid 358, 359
laminates 111, 161, 254, 288, 301, 336, 372
lauric acid 63, 259
LDPE 286
leather coating 174, 214, 291, 293, 301, 308, 353, 354
lecithin 379
–, soyalecithin 385
Lewis acids 230, 274, 275
light stability 108, 162, 186, 207, 208f, 218, 297, 298, 328, 340, 341, 353, 380
light stabilizers 209 (see also HALS)
lime resin 357
linking 24 (see also configuration, microstructure, stereochemistry)
–, head-to-head 24
–, head-to-tail 24, 271, 276
–, of monomers 24
–, tail-to-tail 24
linoleic acid 360, 361
linolenic acid 360, 361
linseed oil 61, 64, 65, 144, 153, 259, 361, 362, 363, 365, 370
liquid membranes 217
living polymerization 17, 274, 275, 373
London-van der Waals forces 382, 385
lubricants 291
macromolecules 12, 28, 281, 284
–, branched 8, 23, 295
–, crosslinked 8, 9, 23
maize oil 65
maleic anhydride/esters 63, 76, 82, 199, 290, 292, 296, 310, 313, 359, 361, 363, 364, 384, 391
maleic resins 343, 349, 358f, 359, 360, 362
maleinization 356
maleinized oil 76, 361, 363f, 364
maleopimaric acid 359
Mannich base 243, 247, 249, 250
manufacture 51, 66, 324
–, acetone process 195
–, acidolysis process 67
–, Advancement Process 228, 251
–, azeotropic process 51
–, BASF process 110
–, block polymerization 280
–, bulk polymerization 279, 280, 282
–, Chemie Linz process 110
–, circulation process 69

- , DSM-Stamicarbon process 110
- , emulsion polymerization 279, 280, 283f, 284, 288, 294, 295, 303, 303, 350
- , fatty acid process 68
- , gas phase polymerization 279
- , gas stream condensation 51
- , Grignard synthesis 323
- , ketimine-ketazine process 190
- , mass polymerization 279, 280
- , melt condensation 51, 69
- , melt polymerization 279
- , Montedison process 110
- , Müller-Rochow synthesis 323
- , Nissan process 110
- , one-stage process 68
- , precipitation polymerization 279, 282
- , prepolymer mixing process 195
- , polycondensation 1, 2, 4, 5, 7, 9, 17, 18, 27, 45, 51, 52, 67, 68, 81, 101
- , postchlorination 291
- , –, fluidized-bed method 291
- , –, solution method 291
- , –, suspension method 291
- , solution polymerization 279, 280, 282
- , solvent process 69
- , suspension polymerization 279, 280, 281f
- , Taffy Process 227
- , transesterification 45, 60, 66, 67, 101, 193, 398
- , two-stage process 66
- marine paints 147, 149, 151, 152, 153, 161, 164, 253, 254, 258, 310, 334, 343, 366
- mass polymerization 279, 280
- mass spectrometry MS 404, 408, 409, 416f, 417, 419, 420
- mastication 341, 343
- MDI 181, 182, 211, 220, 408, 411
- , MDI polymer 186, 190, 217
- mechanical properties 45, 124, 207, 301, 307, 332, 333, 380
- melamine-formaldehyde resins 48, 102, 109f, 144, 196, 252, 265, 293, 299, 305, 306, 308, 309, 313, 334, 349, 354
- , adhesion 116
- , alkylated 111, 112, 113, 114, 117, 260
- , analysis 398, 402, 405, 415
- , applications 111
- , crosslinking 112, 115
- , curing 113
- , etherification 111, 117
- , flexibility 116
- , hardness 116
- , high solids 117
- , HMMM 31, 111, 112, 114, 116, 117, 118, 261, 404
- , properties 110, 116, 118
- , reactivity 116
- , resistance 116
- , testing 422, 426
- , water-borne 117
- melt condensation 51, 69
- melting range 342, 351, 359, 397 (see also softening temperature)
- melt polymerization 279
- mesaconic acid 82
- metal complex polymerization 20 (see also Ziegler-Natta polymerization)
- methacrylate 278, 280, 294, 313, 365, 384, 389
- methylcellulose 281, 348, 353, 423
- methylene bridge 130, 132, 133, 134, 138, 153
- methylenemalonate 278
- methyl ethyl ketone-formaldehyde resins 161f
- methyl ethyl propane diol 82
- methyl methacrylate 198
- methylolation 127, 129, 130
- methylpentamethylenediamine MPMDA 245, 246
- methylphenylsilicone resins 328
- methylsilicone resins 327, 328, 330, 331, 334, 335, 336
- methylstyrene 278
- MF resins 102 (see also melamine-formaldehyde resins)
- micelles 197, 283, 391, 392
- Michael addition 352
- microencapsulation 192, 218
- microstructure 24, 291 (see also configuration, linking, stereochemistry)
- , atactic 25, 276
- , erythro-diisotactic 25
- , ditacticity 24
- , linking 24
- , isotactic 25, 276, 302
- , syndiotactic 25, 276, 302
- , tacticity 24, 25, 302
- , three-diisotactic 26
- moisture-curing coatings 189, 218
- moldings 328
- molecular mass – see molecular weight
- molecular mobility 29
- molecular weight 1, 5, 8, 16, 18, 26f, 28, 34, 46, 47, 52, 134, 137, 150, 162, 173, 174, 175, 177, 180, 184, 188, 196, 197, 198, 199, 237, 244, 248, 251, 254, 257, 258, 261, 274, 282, 284, 289, 293, 297, 299, 301, 302, 309, 313, 329, 341, 342, 351, 352, 353, 367, 379, 384, 386, 389, 390, 392, 393, 403, 407, 415
- , average 7, 14
- , distribution 1, 16, 23, 26, 27, 274, 309
- , –, Poisson 274, 275
- , –, Schulz-Flory 274, 275
- , mass-average 26, 27
- , number-average 26, 27
- , viscosity-average 26
- monomers 124, 159 (see also oils and fatty acids)
- , acids
- , –, adipic acid 49, 62, 82, 199
- , –, azelaic acid 49, 62
- , –, benzoic acid 49, 63
- , –, benzophenonetetracarboxylic acid 369
- , –, *tert*-butyl benzoic acid 49, 63

- monomers, acids
- , - , *tert*-butyl isophthalic acid 49, 50
 - , - , citraconic acid 82, 363
 - , - , crotonic acid 292, 296, 297
 - , - , cyclohexane dicarboxylic acid 50
 - , - , decane dicarboxylic acid 49, 50
 - , - , dimer fatty acid 49, 50, 63, 87, 174, 175, 243
 - , - , dimethylol propionic acid 49
 - , - , diphenolic acid 140
 - , - , fatty acids 45, 60, 61, 63, 76, 144, 199, 254, 259, 353, 360, 361, 385
 - , - , fumaric acid 63, 82, 363
 - , - , hexahydrobenzoic acid 49
 - , - , hexahydrophthalic acid 199
 - , - , hexahydrophthalic anhydride 49, 50
 - , - , hexahydroterephthalic acid 49, 62
 - , - , isodecanoic acid 63
 - , - , isononanoic acid 49, 63
 - , - , isooctanoic acid 63
 - , - , isophthalic acid 49, 62, 82, 199, 398
 - , - , itaconic acid 63, 82, 363
 - , - , lactic acid 63
 - , - , lauric acid 63, 259
 - , - , maleic anhydride 63, 76, 82, 199, 290, 292, 296, 310, 313, 359, 361, 363, 364, 384, 391
 - , - , pelargonic acid 63
 - , - , phthalic acid 199
 - , - , phthalic anhydride 49, 62, 82
 - , - , pyromellitic anhydride 49, 369
 - , - , sebacic acid 49, 62, 82
 - , - , succinic acid 82
 - , - , terephthalic acid 49, 62, 82, 372, 398
 - , - , tetrahydrophthalic anhydride 49, 62, 82, 86
 - , - , trimellitic anhydride 49, 62
 - , - , Versatic acid 63, 77, 295
 - , acrylates
 - , - , acrylamide 280, 303
 - , - , acrylic acid 198, 280, 292, 303, 310, 359, 365, 384, 389
 - , - , acrylic esters 278, 280, 292, 296, 297, 298, 303, 313, 359, 361, 389
 - , - , acrylonitril 243, 278, 294, 303, 310, 359
 - , - , butyl acrylate 198
 - , - , ethylhexyl acrylate 198
 - , - , hydroxyethyl acrylate 198
 - , - , hydroxyethyl methacrylate 198
 - , - , hydroxypropyl methacrylate 198
 - , - , methacrylate 278, 280, 294, 313, 365, 384, 389
 - , - , methyl methacrylate 198
 - , aldehydes
 - , - , acetaldehyde 102, 128, 155, 168, 298
 - , - , paraformaldehyde 127
 - , olefinic 278f
 - , - , butadiene 278, 310, 311, 312
 - , - , butene 278
 - , - , ethylene 277, 278, 280, 296, 297
 - , - , isobutene 278, 280, 290
 - , - , isoprene 278, 280, 312
 - , - , cyclopentadiene 365
 - , - , olefinic, indene 315
 - , - , maleic esters 63, 76, 82, 199, 290, 292, 296, 310, 313, 359, 361, 363, 364, 384, 391
 - , - , mesaconic acid 82
 - , - , methylenemalonate 278
 - , - , methylstyrene 278
 - , - , propene 278
 - , - , styrene 73, 82, 83, 85, 89, 198, 272, 277, 278, 280, 290, 296, 303, 313, 345, 361, 365
 - , - , tetrafluoroethylene 278, 280
 - , - , VeoVa 295, 297
 - , - , vinyl acetate 277, 280, 292, 294, 295, 297
 - , - , vinyl alcohol 298
 - , - , vinylcarbazole 278
 - , - , vinyl chloride 278, 280, 292, 294, 296, 297, 298, 303
 - , - , vinyl ester 278, 303
 - , - , vinyl ether 278
 - , - , vinyl fluoride 278, 280
 - , - , vinylidene chloride 278, 280
 - , - , vinyl isobutyl ether 292
 - , - , vinyl laurate 295, 297
 - , - , vinyl pivalate 296
 - , - , vinyl propionate 292, 295, 297
 - , - , vinylpyrrolidone 278
 - , - , vinyl stearate 296
 - , - , vinyltoluene 303, 365
 - , phenols
 - , - , alkylphenol 124, 125, 243
 - , - , arylphenol 126
 - , - , bisphenol A 101, 124, 126, 128, 129, 147, 148, 153, 225, 226, 227, 230, 237, 251, 252, 253, 254, 255, 258, 259, 260, 262, 266
 - , - , bisphenol F 126, 129, 238, 251, 255, 258, 404
 - , - , butylphenol 129, 140
 - , - , cardanol 124, 126, 129
 - , - , cardol 124, 126, 129
 - , - , cresol 124, 129
 - , - , diphenol 126
 - , - , phenol 124, 129
 - , - , resorcinol 124, 126, 129
 - , - , xylenol 124, 125, 129
 - , polyalcohols
 - , - , butane diol 49, 82, 199
 - , - , cyclohexane dimethanol 49, 50
 - , - , diethylene glycol 49, 82, 199
 - , - , dipropylene glycol 82
 - , - , ethylene glycol 49, 64, 82, 199, 299, 340, 391
 - , - , glycerol 49, 64, 199, 299, 340, 357, 359, 365
 - , - , hexane diol 49, 199
 - , - , hydroxypivalic acid neopentyl glycol ester 49
 - , - , methyl ethyl propane diol 82
 - , - , neopentyl glycol 49, 64, 82, 199
 - , - , pentaerythritol 49, 64, 359, 365, 371
 - , - , propane diol 49, 64, 82, 199
 - , - , tricyclodecane dimethanol 49, 50
 - , - , triethylene glycol 82

- , polyalcohols, trimethylol ethane 64
- , - , trimethylol propane 49, 64, 87, 199
- , - , trimethyl pentane diol 49
- Montedison process 110
- MPMDA 245, 246
- MS 404, 408, 409, 416f, 417, 419, 420
- Müller-Rochow synthesis 323
- multi-coats 335

- NAD 38, 153, 371, 384
- NAEP 245, 246
- N3-amine 245
- N4-amine 245
- NAPCHA 245
- naphthalene-formaldehyde resins 314
- natural oils 360f, 361
- natural products, modified 347
- natural resins 1, 139, 162, 422
- neoabietic acid 354
- neopentyl glycol 49, 64, 82, 199
- network 323, 327
- neutralization 261, 390
- Newtonian flow behaviour 392
- Nissan process 110
- nitrocellulose - see cellulose nitrate
- NMR 105, 106, 114, 116, 292, 401, 409f, 410
- noise-damping coatings 217
- novolaks 123, 128, 132, 137, 138, 146ff, 151, 169, 236, 237, 263
- , alkylphenol 147
- , analysis 402, 404, 405, 408, 410, 420
- , cresol-novolak glycidylether 239, 263
- , crosslink 146
- , epoxy 147, 154, 255, 257, 258
- , formation 146
- , glycidylether 238, 263
- , ortho-novolak 137
- , phenol-novolak glycidylether 238, 263
- nuclear magnetic resonance spectroscopy NMR 105, 106, 114, 116, 292, 401, 409f, 410
- , ¹³C-NMR spectroscopy 112, 116, 409, 410, 411, 412, 413
- , CP/MAS-NMR spectroscopy 411, 412
- , ¹H-NMR spectroscopy 110, 116, 409, 412
- , ¹⁵N-CP/MAS-NMR spectroscopy 411

- occupational safety 219
- oils 45, 60, 136, 138, 139, 143, 148, 151, 153, 170, 313, 343, 353, 358, 360, 362
- , acrylated oil 361, 364f, 365
- , animal 66
- , blown oil 361, 363f
- , bodied oil 361
- , cashew nut 124, 144
- , castor 65, 259, 361, 363
- , chlorinated 362
- , coconut 61, 65, 66, 259, 361
- , conjuen oil 362, 365
- , cotton seed 65, 361
- , cyclo oil 361, 365
- , dehydrated castor 61, 65, 361, 363, 370
- , epoxidized oil 361
- , fish 347, 361
- , gel oils 362
- , grapeseed 65
- , groundnut 65, 66
- , hydrogenated castor oil 361, 362
- , isolene oil 362, 365
- , isomerized oil 361, 362f
- , linseed 61, 64, 65, 144, 153, 259, 361, 362, 363, 365, 370
- , maize 65
- , maleinized oil 76, 361, 363f, 364
- , oiticica 65
- , olive 65
- , palm kernel 66
- , perilla 65
- , polybutadiene 144
- , properties 65, 66
- , safflower 61, 64, 65, 361, 363
- , soya bean 61, 64, 65, 259, 361, 361, 363, 365
- , stand oil 361, 362f
- , styrenated oil 361, 364f, 365
- , sunflower 61, 65, 361
- , tall 61, 65, 66, 144, 314, 347, 354
- , tung 65, 144, 152, 155, 170, 315, 361, 362, 363
- , urethane 193, 194, 362, 365f, 366
- , vegetable 64, 347
- , wood oil 370
- oiticica oil 65
- olefins 284
- oleic acid 360, 361
- oligobutadienes 345f
- olive oil 65
- one-stage process 68
- organosols 36, 37, 291
- overprint varnishes 167
- oxazolidines 202, 203
- oxidation process 342
- oxoalkylation 352

- packaging coatings 139, 143, 149, 151, 175, 213, 260, 265, 293, 294, 314
- PACM 201, 245, 246, 247
- palm kernel oil 66
- palustric acid 354
- pama (polyalkylated methacrylates) 37
- paper coatings 58, 168, 174, 214, 254, 265, 293, 294, 298, 299, 308, 311, 312, 313, 350, 353, 354, 360
- paraformaldehyde 127
- particle size distribution 403
- parquet sealing 108, 212, 214
- PDA 245
- PEGDA 244
- PEHA 244, 245
- pelargonic acid 63
- pentaerythritol 49, 64, 359, 365, 371
- pentaethylenehexamine PEHA 244, 245
- pentanediamine DAMP 245
- perilla oil 65
- permeability 293, 297, 328, 334, 340

- peroxides 90, 270
- petroleum resin 314
- phenol 124, 129
- phenol-acetaldehyd resin 155
- phenol-acetylene resin 155
- phenolalcohol 134, 136
- phenol ester resin 153
- phenol ether resin 138, 154
- , allyl ether resin 139
- phenol-furfurol resin 155
- phenolic resins 31, 45, 47, 123ff, 169, 174, 200, 236, 252, 263, 265, 296, 200, 301, 309, 315, 333, 334, 343, 349, 353, 354, 362
- , Albertol 148
- , alkylphenol resins 123, 136, 152, 153, 260
- , analysis 400, 405, 406, 408, 410, 420
- , Bakelite resin 123
- , quinone methide 135, 136, 144, 145, 152
- , chroman 144, 148, 152, 153
- , commercial products 139, 141
- , compatibility 143
- , condensation 132, 134, 135, 137
- , –, acidic 137
- , –, alkaline 138
- , –, with ammonia 138
- , crosslinking 133, 137, 139, 141
- , curing 134, 136, 139
- , –, acid-curing 142
- , –, cold-curing 142
- , –, heat-curing 141
- , –, elastificated 123
- , dimethylol-phenol 130
- , epoxy 150, 251, 252
- , –, precondensates 150
- , etherified 123
- , flexibility 142, 143, 150, 151
- , functionality 128, 136, 137
- , hardness 149
- , methylation 130
- , methylolphenol 130, 132, 133, 136
- , modified 148, 150
- , –, polymer-modified 150
- , –, with polyvinyl acetal 151
- , –, resin acid modified 148
- , –, rosin-modified 123, 136, 149
- , monomers 124ff
- , oil-reactive 123, 152, 155
- , oil-soluble 123
- , novolak 123, 128, 132, 137, 138, 146ff, 151, 169, 236, 237, 263
- , –, novolak glycidylether 238, 263
- , plasticized 136
- , properties 124
- , reactions 127, 128
- , reactivity 128, 131, 137
- , resistance 124, 149, 150, 153
- , resite 124, 137, 144
- , resitol 124
- , resols 31, 123, 124, 128, 132, 137, 138, 139ff, 142, 144, 145, 148, 149, 151, 152, 153, 261, 315
- , resol ether 138
- , saligenin 130
- , terpene phenol 154
- , terpene phenol ether 154
- , testing 422, 426
- , trimethylol-phenol 130
- , water-soluble 123
- phenoplasts 123 (see also phenolic resins)
- phenoxy resin 252
- phenylsilicone resins 328, 330, 331, 334, 335
- photoacoustic FT-IR spectroscopy 416
- photoinitiator 84, 91, 92, 234, 242, 264
- , reactivity 93
- photoresists 147
- phthalic acid 199
- phthalic anhydride 49, 62, 82
- Pickering emulsifier 281, 282
- pigments 95, 204, 205, 222, 298, 299, 308, 330, 334, 335, 388
- , agglomerates 380, 381
- , aggregates 380, 381
- , deflocculation 381
- , flocculation 380, 381, 383, 384
- , dispersing 380, 381, 386
- , preparations 380
- , sedimentation 386
- , stabilization 381, 382, 383, 384
- pigment wetting 193, 204, 205, 222, 298, 299, 301, 303, 332, 352, 354, 380, 387
- pimaric acid 354
- pinene 314
- piperidine resins 374
- plasticization 72
- , external 297
- , internal 292, 297
- plastic finishing 209, 210, 214, 216, 265, 294, 298, 301, 308, 310, 354
- plasticizer 2, 36, 37, 108, 142, 165, 170, 256, 291, 293, 297, 299, 301, 302, 310, 314, 315, 316, 342, 344, 349, 350, 353, 355, 360, 372
- plastisol 36, 37, 291
- Poisson distribution 274, 275
- polarity 29
- polarography 89
- polyacrylates 38, 143, 152, 165, 203, 254, 258, 285, 293, 295, 296, 303f, 304, 308, 309, 333, 334, 343, 349, 350, 351, 354, 384, 386, 388, 389
- , analysis 398, 401, 415
- , chemical resistance 305, 310
- , compatibility 304
- , copolymers 401
- , –, styrene-acrylate 311
- , –, vinyltoluene-acrylate 311
- , crosslinking 304, 305, 306ff, 307
- , –, autocrosslinking 305, 306
- , –, external crosslinking 305, 306
- , dispersions 141, 215, 307f, 308
- , emulsion 350
- , flexibility 304, 309
- , hardness 303, 304, 309
- , hydrolysis resistance 307

- , hydrophilicity 304, 305
- , hydrophobicity 304, 305
- , polyanions 308
- , polyelectrolytes 308
- , softening point 304
- , solid resin 309
- , solubility 303, 304, 309
- , solutions 308
- , spray powder 309
- , testing 422, 426
- , thermoplastic 308
- , weather stability 307
- polyacrylic resins 197, 198, 200, 209, 210, 216, 219, 303, 400, 401 (see also polyacrylates)
- polyaddition 1, 2, 4, 11, 12, 177, 180, 203, 206, 223, 242, 269ff (see also addition polymerization)
- polyadducts 177ff (see also polyisocyanates, polyurethanes, epoxy resins)
- polyamide imides 370, 374
- polyamides 31, 45, 173ff, 363, 385, 406
 - , adhesion 175
 - , compatibility 175
 - , copolyamides 174
 - , flexibility 175
 - , homopolyamides 173, 174
 - , resistance 174
 - , testing 422
 - , water-thinnable 176
- polyamidoamines 243, 247, 248, 249, 250, 257, 258, 265
- polyamines 177, 201, 237, 242f, 244f, 248, 249, 265 (see also diamines)
 - , aliphatic amines 244f, 249, 250
 - , –, alkylendiamines 246
 - , –, dipropylenetriamine DPTA 245
 - , –, polyetherdiamines 244
 - , –, polyethyleneamines 244
 - , –, –, diethylenetriamine DETA 244, 245
 - , –, –, pentaethylenhexamine PEHA 244, 245
 - , –, –, tetraethylenpentamine TEPA 244, 245
 - , –, –, triethylenetetramine TETA 244, 245
 - , polyoxypropylentriamine 245
 - , polypropyleneamines 245
 - , –, dipropylenetriamine DPTA 245
 - , –, N3-amine 245
 - , –, N4-amine 245
 - , araliphatic amines 247
 - , aromatic amines 247, 249, 250, 256
 - , cyanoethylated 243, 256
 - , cycloaliphatic amines 246, 249, 250
 - , modifications 247
 - , –, epoxide adducts 247
 - , –, Mannich base 243, 247, 249, 250
 - , –, polyamidoamines 247, 248, 249, 250, 257, 258, 265
 - , –, polyamine adducts 248, 249, 250, 265
 - , properties 249, 250
 - , reactions 243
- polyaminoamides 243, 247, 248, 249, 250, 257, 258, 265
- polyanhydrides 242, 251, 263, 265, 371
- polyanions 308
- polyaryloxyphosphazenes 376
- polybenzenes 372 (see also polyphenylenes)
- polybenzoxazoles 373
 - , adhesion 373
 - , chemical resistance 373
 - , radiation stability 373
- polybutadiene 25, 31, 87, 313, 341 (see also oligobutadiene)
 - , acrylonitril elastomers 254
 - , analysis 420
 - , copolymers 312
 - , –, butadiene-styrol 313
 - , emulsions 346
 - , epoxidized 313, 346
 - , maleinized 346
 - , oxydative drying 346
 - , solutions 346
 - , stereochemistry 312, 345
 - , OH-terminated 346
 - , water-thinnable 345
- polybutadiene oil 144, 345
- polycaprolactones 203
- polycarbonate diols 101
- polycarbonates 45, 101, 198, 203, 217, 334
- polycarboxylic acid 242, 251, 265, 362, 383
 - , aliphatic 62
 - , aromatic 62
 - , cycloaliphatic 62
- polychlorobutadiene 344
- polychlorotrifluoroethylene PCTFE 288
 - , aqueous dispersion 388
- polycondensation 1, 2, 4, 5, 7, 9, 17, 18, 27, 45, 51, 52, 67, 68, 81, 101, 173, 325, 368
 - , branching 8
 - , theory of 5, 8
- polycondensates 45ff
- polydimethylsiloxane 393, 394, 416
- polydispersity 26, 27, 274, 405
- polyelectrolytes 308, 384
- polyepoxides – see epoxy resins
- polyesterimids 370
 - , corrosion resistance 370
 - , chemical resistance 370
 - , deformability 370
 - , electrical insulating 370
 - , heat resistance 370
 - , water resistance 370
- polyesters 31, 45f, 101, 138, 142, 144, 152, 165, 170, 198, 200, 203, 210, 215, 219, 233, 242, 254, 257, 263, 293, 295, 333, 334, 354
 - , alkyds – see alkyd resins
 - , analysis 398, 399, 400, 402, 405, 412
 - , saturated 45f, 46, 47, 49, 54, 55, 108, 116, 119
 - , –, adhesion 47, 55
 - , –, applications 57
 - , –, branched 46
 - , –, catalysts 47, 48
 - , –, compatibility 45, 50, 51
 - , –, crystallinity 50

- polyesters
 –, –, crosslinker for 45, 47, 48, 49, 54
 –, –, crosslinking density 54
 –, –, flexibility 47, 50, 55
 –, –, functionality 47, 53
 –, –, gloss 55
 –, –, hardness 50
 –, –, high-solids 55
 –, –, hydrolysis resistance 50
 –, –, linear 46
 –, –, manufacture 51, 52
 –, –, mechanical properties 45
 –, –, molecular weight 45
 –, –, modified 46
 –, –, –, acrylate-modified 46, 47, 53
 –, –, –, epoxy-modified 46, 254
 –, –, –, silicone-modified – see silicone polyester
 –, –, –, urethane-modified 46, 47
 –, –, monomers for 49
 –, –, –, polycarboxylic acids 49
 –, –, –, polyols 49
 –, –, –, powders 55, 58
 –, –, reactivity 45, 47
 –, –, resistance 47, 50, 55
 –, –, solubility 45, 47, 50, 51
 –, –, solutions 52
 –, –, solvent-borne 55
 –, –, sterilizability 47, 50, 51
 –, –, structures of 46
 –, –, UV resistance 50, 51, 55
 –, –, water-borne 52
 –, –, weather stability 51, 55
 –, unsaturated 81f (see also UP resins)
 polytherdiamines 244
 polyethers 194, 199, 200, 203, 208, 217, 371f,
 385, 391, 415, 422
 –, chemical resistance 371
 –, dispersions 200
 –, heat resistance 371
 polyethylene 175, 286f, 287, 314, 342, 344
 –, chlorinated 288, 342, 343
 –, chlorinated polyethylen-vinyl acetate copoly-
 mer 344
 –, chlorosulphonated 287f, 344
 –, crystallinity 286
 –, dispersion 287
 –, fluorinated 287
 –, high-density HDPE 286
 –, low-density LDPE 286
 –, powder 287
 polyethyleneamines 244
 polyethylene glycol 196, 391, 408
 polyethylene terephthalate 31
 polyethyl methacrylate 31
 polyglycoether 384
 polyhydantoins 370, 374f, 375
 polyhydrazides 372
 polyhydroxystearate 386
 polyimids 336, 369f, 370, 374, 420
 polyinsertion 20
 poly(isobutenyl succinic anhydride) 290
 polyisobutylene 31, 289, 290
 –, isoprene copolymer 290
 –, poly(isobutenyl succinic anhydride) 290
 –, styrene copolymer 290
 polyisocyanates 31, 46, 47, 48, 49, 54, 87, 101,
 148, 162, 177ff, 184ff, 188, 189, 191, 192, 196,
 197, 201, 202, 204, 207, 208, 209, 210, 211,
 213, 216, 217, 220, 242, 251, 258, 265, 293,
 305, 306, 309, 313, 315, 346, 350, 354, 360,
 371
 –, aliphatic 208
 –, analysis 411
 –, biuret 178, 186, 187, 188, 190
 –, blocked 190, 191, 212, 219, 257, 260, 262, 265
 –, cycloaliphatic 208
 –, HDI adduct 187, 188, 190, 217
 –, HDI trimer 187, 188, 190, 216
 –, IPDI trimer 188, 189, 190, 191, 219
 –, microencapsulated 192, 218
 –, MDI polymer 186, 190, 217
 –, prepolymers 189ff
 –, TDI adduct 185, 190
 –, TDI trimer 185, 190
 –, uretdione 179, 188, 189, 190, 192, 216, 219
 polyisocyanurate – see isocyanurate
 polyisoprene 313, 341, 343
 polylactones 199, 203
 polymer-analogous reaction 299, 345
 polymercaptans 242
 polymerization 24, 160, 162, 222, 234, 236, 237,
 242, 264, 270, 315, 356, 361
 –, addition 1, 2, 4, 7, 14, 101, 269ff, 372
 –, –, kinetics 15, 283
 –, –, theory of 12
 –, bead polymerization 283, 309
 –, block polymerization 280
 –, bulk polymerization 279, 280, 282, 295, 303,
 309, 373
 –, degree of 5, 6, 7, 10, 16, 272, 274, 275
 –, electrochemical 270
 –, emulsion polymerization 279, 280, 283f, 284,
 288, 294, 295, 303, 350
 –, free-radical 12, 16, 17, 18, 20, 27, 162, 264,
 269, 271, 272, 273, 275, 277, 282, 286, 290,
 294, 310, 364
 –, gas phase polymerization 279
 –, high-pressure 286
 –, industrial 279ff
 –, initiation 269, 270, 273, 274, 282
 –, insertion 276
 –, ionic 17, 18, 20, 27, 269, 273, 274, 282
 –, –, anionic 273, 275, 278, 279, 280, 310, 345
 –, –, cationic 273, 275, 276, 278, 279, 280, 302,
 310, 345, 372
 –, –, living 17, 274, 275, 373
 –, low-pressure 286
 –, mass polymerization 279, 280
 –, mechanism of 12, 278
 –, melt polymerization 279
 –, metal complex 20
 –, mixed 276 (see also copolymerization)

- , monomers for 277ff
- , photoinitiated 270
- , precipitation polymerization 279, 282
- , propagation 271, 273, 274, 276, 282
- , radical 84, 92, 93, 270, 271, 278, 280, 345
- , rate of 16, 273
- , ring-opening 273, 373, 375
- , solution polymerization 279, 280, 282, 295, 303, 373
- , substance polymerization 283
- , suspension polymerization 279, 280, 281f, 288, 294, 295, 303
- , termination 13, 14, 15, 129, 271, 272, 273, 275, 276, 282, 325
- , Ziegler-Natta 17, 20, 274, 275, 278, 280, 286, 310, 345
- polymers (see also resins)
 - , addition 269ff
 - , chain 8, 13, 29, 174, 271
 - , –, branched 23, 295
 - , –, crosslinked 23
 - , –, length 11, 16, 274
 - , –, linear 23
 - , –, radical 272
 - , –, stereochemistry 24
 - , –, structure 23, 24
 - , –, termination 13, 14, 15, 129, 271, 272, 273, 325
 - , –, transfer 14, 15, 16, 272, 295
 - , –, constant 272
 - , compatibility 30
 - , dispersion 35, 36, 285, 340
 - , groups 285ff
 - , inorganic 375
 - , network 327
 - , polarity 29
 - , radical 271
 - , salt 34, 151 (see also polyelectrolytes)
 - , solubility 28
 - , solution 33, 34, 36, 285
 - , step-growth 5
 - , tacticity 25
 - , water-soluble 388
- polymethacrylate 303f, 304
 - , pama (polyalkylated methacrylates) 37
 - , softening point 304
- polymethyl methacrylate 31, 152, 280, 371
- polyolefins 285f, 343
 - , chlorinated 342
 - , halogenated 285
 - , testing 422
- polyols 189, 197, 198, 204, 332
 - , dispersions 200
- polyorganosiloxanes 323, 324, 325, 326, 337
- polyoxadiazoles 372
 - , chemical resistance 372
 - , electrical insulation 372
 - , temperature resistance 372
- polyoxazolidinones 373
- polyoxazolines 373
- polyoxyethylenediamine PEGDA 244
- polyoxyphenyls – see polyethers
- polyoxypropylenediamine PPGDA 244
- polyoxypropylenetriamine 245
- polyparabanic acid 370, 374f, 375
 - , hardness 374
 - , heat resistance 374
- polyphenols 242, 251, 252
- polyphenylenes 371, 372
 - , chemical resistance 372
 - , heat resistance 372
- polyphenylene sulphides 368f
 - , chemical resistance 368
 - , copolymers 368
 - , hardness 368
 - , heat resistance 368
- polyphenylquinoxalines 374
 - , flexibility 374
 - , solubility 374
- polyphenyls 372 (see also polyphenylenes)
- polyphosphazenes 376
 - , copolymers 376
- polypropylene 31, 175, 286, 289, 342, 344
 - , chlorinated 288, 342, 343, 344
- polypropyleneamines 245
- polypropylene glycol 412
- polysaccharides 347, 353f, 388, 389
 - , disaccharides 353
- polysilazanes 375
- polysiloxane 323, 324, 325, 326, 337, 393, 394
 - , polyester-modified 394
 - , polyether-modified 394
- polyspiran resins 370, 371
- polystyrene 31, 280, 285, 302, 310f, 407
 - , copolymers 310, 311
 - , –, styrene-acrylate 311
 - , –, styrene-butadiene 31, 311, 312
 - , –, testing 422
 - , dispersions 311
 - , SB-dispersions 311, 312
 - , soluble 310
- polysulphazenes 375
- polysulphides 367f
 - , elastomers 367
 - , heat stability 367
 - , ozone resistance 367
 - , water resistance 367
 - , weather stability 367
- polysulphone resins 368
 - , chemical stability 369
 - , hardness 369
 - , radiation stability 369
- polysulphones 368
 - , hardness 368
 - , resistance 368
 - , polyaryl ether sulphones 368
 - , polyaryl sulphones 368
 - , polyether sulphones 368
 - , polyphenylen sulphones 368
- polytetrafluorethylene PTFE 287f, 288, 420
 - , chemical resistance 288
 - , crystallinity 288
 - , dispersion 288

- polytetrahydrofuran 101, 200
 polytetrahydrofurandiamine PTHFDA 244
 polythiaphosphazenes 376
 polythioether ketone 375, 423
 polythiols 376
 polyurethane resins 177, 181, 184, 191, 406
 polyurethanes 101, 149, 170, 177, 194, 200, 203, 207, 293, 329, 333, 334
 –, analysis 398, 415
 –, coatings 180, 185, 192, 203f, 209
 –, –, air-drying 190
 –, –, CAB-modified 352
 –, –, force-drying 190
 –, –, high-solids 190, 205, 210
 –, –, microencapsulated 218
 –, –, moisture-curing one-pack 189, 218
 –, –, one-pack 214, 218
 –, –, physically drying 214
 –, –, powder 218f
 –, –, radiation-curing 218
 –, –, solvent-free 190, 216, 217, 218
 –, –, stoving 209, 213, 215, 218
 –, –, two-pack 203, 204, 205, 209, 210, 215, 216, 217
 –, –, water-borne 190, 214, 215, 216
 –, –, weatherstable 190
 –, dispersions 194, 195, 196, 207, 214, 215
 –, elastomers 192, 193, 214
 –, ionomers 194, 195
 –, oils 193
 –, precursors 178
 –, testing 422, 426
 –, thickeners 196, 197
 polyvinyl acetals 142, 151, 152, 285, 297, 300f, 422
 –, modified phenolic resin 151
 polyvinyl acetate PVAc 31, 277, 295f, 296, 297, 299, 351
 –, adhesion 296
 –, analysis 400
 –, application 297, 298
 –, compatibility 296, 298
 –, copolymers 297, 298, 412
 –, dispersions 297f, 298, 299
 –, solid 296
 –, solution 296
 –, powder 298
 –, water-soluble 297
 polyvinyl alcohol 281, 282, 285, 297, 298f, 300
 –, powder 299
 polyvinyl butyral 31, 146, 151, 152, 301f
 polyvinyl chloride PVC 31, 37, 289, 290f, 372
 –, application 291
 –, copolymers 165, 167, 168, 290f, 292, 293, 302, 344, 372
 –, dispersions 293
 –, postchlorinated CPVC 291, 292
 –, solubility 291
 –, testing 422, 426
 polyvinyl esters 285, 293, 295f, 296
 –, copolymers 296
 –, dispersions 296, 297, 298
 –, testing 422
 polyvinyl ethers 285, 301f, 302, 343, 350
 –, application 302
 –, compatibility 302
 –, solubility 302
 polyvinylidene chloride PVDC 294
 –, application 294
 –, chemical resistance 294
 –, copolymers 294
 –, crystallinity 294
 –, dispersion 294
 –, impermeability 294
 polyvinyl formal 300
 polyvinylidene fluoride PVDF, PVF2 294
 –, application 295
 –, radiation resistance 295
 –, weather resistance 295
 polyvinyl nitrate 299
 polyvinyl phosphate 299
 polyvinyl propionate 295, 297
 polyvinylpyrrolidone 285, 302f, 303
 –, adhesion 303
 –, compatibility 303
 –, copolymers 302
 polyvinyl resins 150, 285, 349, 358
 polyvinyls 204, 285, 364
 polyvinyl sulphate 299
 postchlorination 291, 292
 –, –, fluidized-bed method 291
 –, –, solution method 291
 –, –, suspension method 291
 pot life 108, 205, 248, 249, 256, 257, 258
 powder coatings 38, 40, 42, 43, 47, 49, 54, 55, 56, 58, 87, 150, 151, 161, 168, 174, 185, 189, 218, 251, 252, 253, 259, 262, 263, 264, 265, 287, 291, 295, 301, 311, 369, 370, 371, 372
 –, analysis 398
 –, corona charging 42, 262
 –, electrostatic spraying 295, 369, 370, 371
 –, fluidized-bed sintering 38, 43, 174, 262, 287, 371
 –, hybrid powders 47
 –, polyurethane 191
 –, testing 426
 –, TGIC-crosslinked powders 47
 –, triboelectric charging 42, 262
 PPGDA 244
 preadducts 12, 231
 precipitation polymerization 279, 282
 prepolymer mixing process 195
 prepolymers 189f, 194
 –, phenol-blocked 191
 –, TDI prepolymer 201
 primers 58, 147, 150, 161, 214, 252, 253, 254, 261, 265, 308, 310, 313, 335, 337, 340, 344, 346
 primer surfacer 212, 214
 printed circuits 161
 printing inks 58, 145, 147, 148, 149, 161, 164, 167, 168, 170, 175, 176, 250, 301, 303, 311, 314, 343, 350, 353, 357, 358, 360, 364, 366
 –, overprint varnishes 167

- processing 33, 40
- , atomization 42
- , –, high rotational speed 42
- , –, by rotating bells 42
- , –, by rotating discs 42
- , brushing 40, 212
- , curtain coating 95
- , dipping 40, 288, 297, 306
- , dispersing 380
- , electrodeposition 35, 40
- , extrusion 219, 369
- , flow coating 41, 288
- , injection moulding 369
- , one-pack system 108
- , powder coatings 42, 49, 262, 295
- , –, corona charging 42, 262
- , –, electrostatic spraying 295, 369, 370, 371
- , –, fluidized-bed sintering 38, 43, 174, 262, 287, 371
- , –, triboelectric charging 42, 262
- , reverse coating 95
- , roller coating 41, 95, 212, 392
- , rolling 40
- , rubbing 40
- , spraying 41, 95, 212, 288, 297, 371
- , –, airless 41
- , –, airmix 41
- , –, compressed air 41
- , –, electrostatic 42
- , –, flame 174
- , –, hot 41
- , two-component material 42, 108
- , tumbling 41
- production – see manufacture
- promotor 323
- propagation 13, 14, 15, 271, 273, 274, 276, 282
- propane diol 49, 64, 82, 199
- propene 278
- properties
- , abrasion resistance 193, 207, 212, 217, 252, 292, 293, 366
- , adhesion 47, 55, 116, 150, 153, 167, 170, 175, 214, 223, 249, 250, 251, 254, 257, 260, 264, 277, 289, 293, 294, 296, 297, 301, 332, 340, 360, 369, 372, 373
- , chemical resistance 189, 193, 207, 210, 211, 213, 214, 217, 223, 243, 248, 250, 251, 252, 254, 260, 263, 288, 293, 294, 305, 330, 369, 370, 371, 372, 373
- , compatibility 45, 50, 51, 71, 119, 143, 164, 166, 168, 169, 175, 257, 289, 291, 293, 296, 297, 301, 302, 303, 304, 310, 328, 344, 351, 353, 358, 380, 393, 394
- , flexibility 47, 50, 55, 108, 116, 142, 143, 150, 151, 175, 193, 207, 210, 214, 218, 243, 249, 250, 251, 252, 254, 255, 256, 257, 260, 263, 264, 289, 292, 293, 301, 304, 309, 310, 332, 343, 351, 353, 366, 421
- , gloss 55, 149, 167, 168, 170, 210, 328, 332, 360, 372, 380, 421
- , hardness 50, 108, 116, 149, 162, 168, 193, 207, 223, 243, 249, 250, 252, 260, 263, 303, 304, 309, 310, 332, 333, 350, 353, 358, 360, 368, 421
- , hiding power 167, 380, 389, 390
- , light stability 108, 162, 186, 207, 208f, 218, 297, 298, 328, 340, 341, 353, 380
- , mechanical 45, 124, 207, 301, 307, 332, 333, 380
- , permeability 293, 297, 328, 334, 340
- , pigment wetting 193, 204, 205, 222, 298, 299, 301, 303, 332, 352, 354, 380, 387
- , resistance 47, 50, 55, 116, 124, 149, 150, 153, 168, 170, 174, 200, 250, 254, 295, 301, 332, 350, 353, 357, 360, 367, 368, 370
- , solubility 45, 47, 50, 51, 164, 166, 289, 292, 293, 294, 302, 303, 304, 310, 349, 351, 351, 353, 358, 374, 379, 394
- , temperature resistance 101, 323, 328, 330, 332, 334, 335, 341, 367, 368, 369, 370, 371, 373
- , weather stability 51, 55, 81, 108, 181, 207, 208f, 218, 219, 264, 287, 295, 298, 307, 324, 330, 332, 333, 334, 340, 367, 380
- propylenediamine PDA 245
- protective colloids 281, 298, 299, 303, 308, 348, 353, 373
- protein 380
- PTFE 287f, 288, 420
- PTHFDA 244
- PU resins – see polyurethane and polyisocyanate
- PVC 31, 37, 289, 290f, 372
- PVDF 294
- PVF2 294
- pyrolysis gas chromatography 397, 400, 401, 402
- pyromellitic anhydride 49, 369

- Q, e system 19, 84
- quality control – see testing
- quenchers 209
- quinone methide 135, 136, 144, 145, 152, 355

- radiation curable coatings 43, 54, 55, 56, 84, 91, 95, 161, 218, 242, 252, 254, 264, 309, 327, 346, 352, 371
- radical polymerization 84, 92, 93, 270, 271, 278, 280, 345
- radicals 91
- , free 15, 19
- raman spectroscopy 89
- reactions
- , addition 231, 270
- , alcoholysis 362, 365
- , aldol addition 130
- , aldol condensation 160
- , chain termination 14, 15, 129
- , chain transfer 15, 272, 295
- , co-condensation 331
- , condensation 11, 327
- , cyclization 342
- , cyclotrimerization 376

- reactions
 –, decarboxylation 356
 –, dehydration 361
 –, dehydrogenation 355, 356, 361
 –, dehydrohalogenation 230
 –, depolymerization 342
 –, Diels-Alder reaction 175, 355, 358, 362, 363, 364, 365
 –, dimerization 180
 –, 1, 3-dipolar addition 372
 –, disproportionation 202, 356
 –, electrophilic substitution 128
 –, ene reaction 345, 363, 364
 –, epoxidation 361, 362
 –, esterification 170, 259, 348, 349, 356, 357, 359, 370
 –, etherification 111, 117, 170, 360
 –, exothermic 17
 –, glycidylation 228
 –, hydrogenation 167, 355
 –, initiation 12, 13, 15, 269, 270, 273, 274, 282
 –, intermolecular 11
 –, intramolecular 11
 –, isomerization 342, 356, 361, 362
 –, maleinization 356
 –, methylolation 127, 129
 –, Michael addition 352
 –, nitration 349
 –, oxoalkylation 352
 –, polycondensation 1, 2, 4, 5, 7, 9, 17, 18, 27, 45, 51, 52, 67, 68, 81, 101, 173, 325, 368
 –, polymer-analogous 299, 345
 –, polymerization 24, 160, 162, 222, 234, 236, 237, 242, 264, 270, 315, 356, 361
 –, propagation 13, 14, 15, 271, 273, 274, 276, 282
 –, redox process 136
 –, termination 16, 17
 –, transesterification 45, 60, 66, 67, 101, 191, 193, 298, 299, 362, 365, 398
 –, trimerization 179, 180, 185, 187
 –, Williamson reaction 352
 reactivity 93, 128, 129, 219, 222, 228, 248, 251, 255, 325
 redox process 136
 regulators 14, 15, 272
 –, mercaptan 272
 –, thiol 272
 reinforced plastics 81
 release lacquers 175
 repair coatings 81, 91, 253, 309
 resin 9, 12, 26, 31, 60, 137, 138, 139, 323
 –, acids 148, 347, 354, 357, 359 (see also rosin)
 –, –, modified phenolic resin 148
 –, acrylic – see polyacrylic resins, polyacrylates, polymethacrylates
 –, aldehyde resins 45, 159, 166, 168f, 349, 405
 –, –, compatibility 169
 –, amber 148, 347
 –, carbamide 349
 –, copal 148, 347, 358
 –, dammar 347
 –, elemi 347
 –, esters 357, 358
 –, flexibilizing 257
 –, furan resins 155f, 368
 –, hydrocarbon 31, 169, 212, 285, 314f, 349
 –, –, coumarone-indene resin 241, 243, 285, 314, 315, 316
 –, –, petroleum resin 314
 –, –, terpene resin 314
 –, ketone resins 45, 159, 161f, 162, 163, 164, 166, 167, 204, 349
 –, –, acetone-formaldehyde resins 162
 –, –, acetophenone-formaldehyde resins 164f, 167
 –, –, application 161, 162, 164, 167, 168
 –, –, compatibility 162, 163, 164, 165, 166
 –, –, cyclohexanone resins 163
 –, –, cyclohexanone-formaldehyde resins 163f
 –, –, methyl ethyl ketone-formaldehyde resins 161f
 –, –, properties 162, 163, 164, 166, 167
 –, lime resin 357
 –, maleic 343, 349, 358f, 359, 360, 362
 –, naphthalene-formaldehyde resin 314
 –, natural 1, 139, 162, 422
 –, rubber-based 341
 –, sulphonamide 120, 349
 –, synthetic 1, 123, 165, 166
 –, testing 426
 –, xylene-formaldehyde resin 170, 314
 –, zinc resin 357
 resin acids 148, 347, 354, 357, 359 (see also rosin)
 –, esters 357, 358
 resistance 47, 50, 55, 116, 124, 149, 150, 153, 168, 170, 174, 200, 250, 254, 295, 301, 332, 350, 353, 357, 360, 367, 368, 370
 resite 124, 137, 144
 resitol 124
 resols 31, 123, 124, 128, 132, 137, 138, 139ff, 142, 144, 145, 148, 149, 151, 152, 153, 261, 315
 –, acid-curing 142
 –, alcohol-soluble 141
 –, analysis 402
 –, bifunctional 139
 –, butanolized 138
 –, cold-curing 142
 –, curing 144
 –, etherified 123, 134, 143, 260
 –, formation 139
 –, highly condensed 138
 –, plasticized 144
 –, resol ether 138
 –, self-curing 144
 –, water-soluble 140
 resorcinol 124, 126, 129
 ricinoleic acid 361
 ring formation parameter 11
 ring-opening polymerization 273, 373, 375
 road marking paints 153, 161, 167, 169, 250, 293, 310, 311, 343, 344

- roller coatings 150
- rosin 31, 138, 145, 148, 170, 347, 354f, 370
 - , dehydrogenated 357
 - , esters 145, 357
 - , gum rosin 354
 - , phenolic resin modified 123, 136, 149
 - , polymerized 356, 357
 - , reactions 355, 356
 - , salts 357
 - , tall-oil modified 354
 - , testing 426
 - , wood rosin 354
- rubber 314, 315, 367
 - , arabian 380
 - , chlorinated 151, 165, 170, 289, 296, 297, 313, 315, 342, 343f, 344, 358, 362, 372, 422
 - , cyclized 342f
 - , natural 313, 341, 342, 343
 - , silicone rubber 329
 - , synthetic 313, 342, 343
 - , testing 422
- saccharose 353
- safety glass 301
- safflower oil 61, 64, 65, 361, 363
- SB-dispersions 311, 312
- scavengers 344
- Schiff bases 134
- Schulz-Flory distribution 274, 275
- sealing compounds 164, 310, 346, 367
- sebacic acid 49, 62, 82
- SEC 104, 405
- secondary ion mass spectrometry SIMS 417
- sedimentation 386
- self-acceleration 17
- semicellulose 354
- sequence analysis 412
- SFC 396, 407f, 408, 417
- SFE 408
- shelf life 327, 328, 331, 334, 338
- shellac 123, 347, 360f
- shop primer 152, 258
- siccatives – see driers
- silanes 323, 337
 - , alkylchlorosilanes 325
 - , alkoxysilanes 325, 326
 - , dimethylchlorosilane 324, 325
 - , dimethyldichlorosilane 323, 324, 325, 326
 - , hydrogenchlorosilanes 327
 - , methyldichlorosilane 324, 328
 - , methyltrichlorosilane 324, 325
 - , organochlorosilanes 327
 - , organohydrogensilanes 327
 - , phenylchlorosilanes 325
 - , tetramethylsilane 324
 - , trichlorosilane 324
 - , trimethylchlorosilane 324, 329
 - , vinylchlorosilanes 325, 327
- silanols 325
 - , organosilanols 325
- silicates 323, 339
 - , alkyl silicates 339, 340f, 341
 - , ethyl silicate 340, 341
 - , –, paints 341
 - , methyl silicate 340
- silicate paints 340
- silicic acid 328, 334
 - , esters 340, 341
 - , ortho silicic acid 340
 - , polysilicic acid 339, 340
- silicification 340
- siliconates 337
- silicone acrylates 333
- silicone alkyls 333
- silicone emulsions 337
- silicone oils 323, 325, 337, 393
 - , methylsilicone oil 324
- silicone resins 200, 323ff, 324, 325, 327, 331, 334, 337, 354
 - , catalysts 337
 - , combinations 331, 332
 - , crosslinking 326, 328, 329, 330, 331
 - , –, by addition 327
 - , –, by condensation 327
 - , –, by peroxide 327
 - , –, by radiation 327
 - , curing 326, 328, 329
 - , drying 329
 - , formation 325
 - , manufacture 324
 - , methylsilicone resins 327, 328, 330, 331, 334, 335, 336
 - , methylphenylsilicone resins 328
 - , MQ-resins 329
 - , paints 334, 335, 338
 - , phenylsilicone resins 328, 330, 331, 334, 335
 - , properties 329, 330
 - , solutions 329
 - , structure 324, 325
 - , testing 422
 - , uses 334, 335
- silicone polyesters 46, 47, 53, 333
 - , analysis 398, 399, 401
- silicones 323, 324, 337, 340, 379
 - , bodying 325, 331
 - , crosslinking 325
 - , elastomers 324
 - , Grignard synthesis 323
 - , intermediates 325, 332
 - , Müller-Rochow synthesis 323, 324, 328
- silicone rubber 329
- siloxanes 323, 325, 337
 - , crosslinking 325, 326
 - , H-siloxanes 324
 - , polyorganosiloxanes 323, 324, 325, 326, 337
 - , reactivity 325
- SIMS 417
- size exclusion chromatography SEC 104, 405
- soaps 281, 282

- solubility 28, 45, 47, 50, 51, 164, 166, 289, 292, 293, 294, 302, 303, 304, 309, 310, 349, 351, 351, 353, 358, 374, 379, 394
- solvent process 69
- softening temperature 237, 238, 239, 291, 304, 421, 425 (see also melting range)
- solubility parameter 30, 31
- solutions 33, 34, 36, 52, 285, 296, 308, 329, 346
- solution polymerization 279, 280, 282, 295, 303, 373
- soya bean oil 61, 64, 65, 259, 361, 361, 363, 365
- spirit lacquers 147
- spiro lactone 371
- spraying 41, 95, 150, 212, 288, 297, 371
- , airless 41
- , airmix 41
- , compressed air 41
- , electrostatic 42
- , flame 174
- , hot 41
- spray powder 309
- stabilization 290, 303, 344, 382, 386
- , electrostatic 382, 383
- , Coulombic 382
- , entropic 382
- , of polymers 282, 344
- , resonance 277
- , steric 382, 383, 384, 385
- standards 423, 424
- , ASTM 423, 424
- , DIN 423, 424
- , ISO 423
- stand oil 361, 362f
- starch 347, 353
- Staudinger index 29
- steady state 15, 19
- stearic acid 360, 361
- stereochemistry 24 (see also configuration, linking, microstructure)
- stoving enamels 4, 24, 43, 61, 143, 150, 207, 209, 210, 212, 213, 215, 218, 259, 260, 265, 309, 313, 329, 350, 353, 368, 370
- stripping lacquers 353
- styrene-acrylate copolymers 311
- styrene-butadiene copolymers 31, 311, 312
- styrene-isobutene copolymer 290
- styrenated oil 361, 364f, 365
- styrene 73, 82, 83, 85, 89, 198, 272, 277, 278, 280, 290, 296, 303, 313, 345, 361, 365
- substance polymerization 283
- substrate 96
- , chemical conversion 40
- , cleaning 40
- , pretreatment 40, 335
- succinic acid 82
- sucrose 353, 354
- , sucrose acetate isobutyrate SAIB 354
- , sucrose benzoate 354
- sugar 347
- sulphonamide resins 120, 349
- sunflower oil 61, 65, 361
- supercritical fluid chromatography SFC 396, 407f, 408, 417
- supercritical fluid extraction SFE 408
- surface sealers 217
- surface tension 393
- surfactants 381, 391
- suspension polymerization 279, 280, 281f, 288, 294, 295, 303
- synthetic resins 1, 123, 165, 166
- tackifiers 147, 153, 355
- tacticity 24, 25, 302
- Taffy Process 227
- tall oil 61, 65, 66, 144, 314, 347, 354
- TCD 246
- TCD-diamine 245
- TDI 181, 186, 211, 219, 251, 391, 404, 408
- , TDI adduct 185, 190
- , TDI trimer 185, 190
- techniques – see processing
- temperature resistance 101, 323, 328, 330, 332, 334, 335, 341, 367, 368, 369, 370, 371, 373
- TEPA 244, 245
- terephthalic acid 49, 62, 82, 372, 398
- termination 13, 14, 15, 16, 17, 129, 271, 272, 273, 275, 276, 282, 325
- , –, by chain transfer 272, 295
- , –, by combination 271
- , –, by disproportionation 271, 275
- terpene phenol 154
- , terpene phenol ether 154
- terpene phenolic resin 31, 154, 155
- terpene resins 314
- terpenes 354
- terpolymers 293, 300
- testing 421, 422
- , acid number 166, 362, 421, 425
- , amine number 248, 424
- , colour 425
- , flow time 424
- , hydrolysis number 421, 425
- , hydroxyl number 166, 414, 415, 421, 424
- , iodine number 166, 421, 425
- , miscibility 426
- , oil number 425
- , refractive index 424
- , softening point 425
- , solids content 425
- , solubility 426
- , surface tension 425
- , viscosity 424
- , water content 425
- TETA 244, 245
- tetraethylenepentamine TEPA 244, 245
- tetrafluoroethylene 278, 280
- tetrahydroabietic acid 355, 356
- tetrahydrophthalic anhydride 49, 62, 82, 86
- tetramethylxylene diisocyanate TMXDI 183
- textile coatings 214, 293, 297, 298, 299, 308, 353
- textile fibre finishes 141
- textured wall papers 291

- TGA 330, 419, 420
TGIC 47, 230, 264
thermogravimetric analysis TGA 330, 419, 420
thermomechanical analysis TMA 419, 421
thermoplastics 308
thickeners 89, 196, 299, 303, 348, 353, 373, 379, 386f, 387
–, acrylate 388, 389f, 390
–, associative 196
–, cellulose 387, 388f, 389, 390, 392
–, HEUR 196
–, inorganic 386
–, mechanism 391
–, polymeric 386
–, polysaccharide 388, 389
–, polyurethane PUR 196, 386, 387, 388, 390f, 391, 392
thinner, reactive 81, 83, 201, 218, 241, 242, 266
thioplasts 367
thixotropy 175
tinting pastes 364
titanium acrylates 376
TMA 419, 421
TMD 245, 246
TMDI 181, 184
TMXDI 183
toluene diisocyanate TDI 181, 186, 211, 219, 251, 391, 404, 408
toners 161, 168
topcoats 61, 149, 200, 252, 309, 312, 346, 374
torsional vibration analysis 419
toxicology 34, 96, 219, 243, 248, 266, 330, 338
transesterification 45, 60, 66, 67, 101, 191, 193, 298, 299, 362, 365, 398
triazine resins 109 (see also melamine-formaldehyde resins)
tricyclodecane dimethanol 49, 50
tricyclododecanediamine TCD 246
triethylamine 77
triethylene glycol 82
triethylenetetramine TETA 244, 245
triglycerids 347
triglycidyl isocyanurate TGIC 47, 230, 264
trimellitic anhydride 49, 62
trimerization 179, 180, 185, 187
trimethylcyclohexanone 164
trimethyleneamine structure 134
trimethylhexamethylenediamine TMD 245, 246
trimethylhexamethylene diisocyanate TMDI 181, 184
trimethylol ethane 64
trimethylol-phenol 130
trimethylol propane 49, 64, 87, 199
trimethyl pentane diol 49
tris-(dimethylaminomethyl)phenol 244
trisphenol 236
Trommsdorff effect 17, 280
tung oil 65, 144, 152, 155, 170, 315, 361, 362, 363
turpentine oil 314
two-stage process 66
UF resins 102 (see also urea-formaldehyde resins)
ultrafiltration 41, 77
ultraviolet spectroscopy UV 409, 418
UP resins 45, 81f, 341
–, air-drying 81, 86
–, allyl-modified 83, 86, 87, 88
–, analysis 401
–, applications 81, 90, 91, 95
–, crosslinking 83, 85
–, curing 84, 90
–, –, air drying system 86
–, –, electron beam radiation 95
–, –, inhibition 84, 85
–, –, UV 84, 91, 94, 95
–, –, with styrene 85
–, e-Q diagram 84
–, evaporation of styrene 89
–, flammability 89
–, gelling time 91
–, manufacture 89
–, monomer-free 87
–, monomers 81, 82, 83
–, –, alcohols 83
–, –, dicarboxylic acids 82
–, –, diols 82
–, paraffin wax system 85
–, polybutadiene-modified 87
–, polyisocyanate-modified 87
–, powder coatings 87
–, properties 81
–, solutions 83
–, –, in solvents 83
–, –, in styrene 84, 85
–, structure 81
–, styrene-free 87
–, testing 422, 426
–, toxicology 96
–, water-borne 83
urea 178
urea-formaldehyde resins 102, 103f, 142, 144, 252, 260, 265, 299, 305, 313, 362
–, alkylated 107
–, analysis 398, 405, 407, 411
–, application 108
–, catalysts 106
–, curing 106, 108
–, etherification 107
–, plasticized 108
–, pot life 108
–, properties 104, 108
–, structures 105
–, testing 422
–, unplasticized 107
uretdione 179, 188, 189, 190, 192, 216, 219
urethane alkyds 193
urethane oil 193, 194, 362, 365f, 366
uses
– of alkyd resins 71
– of polycarbonate 101
– of silicone resins 334
– of UP resins 95

- UV absorber 209
UV spectroscopy 409, 418
UV-VIS spectroscopy 418
- vegetable oil 64, 347
vehicle repair 209
Veova 295, 297
Versatic acid 63, 77, 295
vinyl acetate 277, 280, 292, 294, 295, 297
vinyl acetate-polyethylene copolymer 344
vinyl alcohol 298
vinylcarbazole 278
vinyl chloride 278, 280, 292, 294, 296, 297, 298, 303
vinyl ester 278, 303
vinyl ether 278
vinyl fluoride 278, 280
vinylidene chloride 278, 280
vinyl isobutyl ether 292
vinyl laurate 295, 297
vinyl pivalate 296
vinyl polymers 285f
vinyl propionate 292, 295, 297
vinylpyrrolidone 278
vinyl resins – see polyvinyl resin, vinyl polymers
vinyl stearate 296
vinyltoluene 303, 365
vinyltoluene-acrylate copolymers 311
viscosity 17, 28, 29, 72, 119, 138, 146, 186, 187, 188, 200, 201, 214, 216, 217, 222, 237, 238, 239, 244, 248, 285, 291, 293, 307, 340, 349, 351, 369, 381, 384, 386, 387, 388, 390, 393, 424
–, diagram 387, 392
–, Einstein's law 29
–, intrinsic 29
VOC 201
vulcanization 342
wash primers 142, 143, 152, 161, 301
water-borne coatings 52, 55, 56, 83, 117, 140, 123, 150, 154, 174, 176, 190, 214, 215, 216, 248, 258, 261, 297, 303, 309, 345, 352, 360, 364, 380, 382, 384, 388, 390
water-glass 339, 340, 341
–, lithium water-glass 340
–, potassium water-glass 340
–, sodium water-glass 340
weather stability 51, 55, 81, 108, 181, 207, 208f, 218, 219, 264, 287, 295, 298, 307, 324, 330, 332, 333, 334, 340, 367, 380
Williamson reaction 352
wire enamels 151, 152, 174, 369, 370, 371, 374
wood coatings 58, 81, 90, 103, 142, 168, 214, 265, 297, 298, 308, 311, 334, 346, 350, 352, 353, 354, 360, 364, 366
wood oil 370
wood rosin 354
woodworking industry 103, 111, 340
- mXDA 45, 247
XDI 181, 183
XPS 418
X-ray fluorescence spectroscopy 418
X-ray photoelectron spectroscopy XPS 418
xylene-formaldehyde resin 170, 314
xylenol 124, 125, 129
m-xylylenediamine mXDA 245, 247
xylylene diisocyanate XDI 181, 183
- Ziegler-Natta polymerization 17, 20, 274, 275, 278, 280, 286, 310, 345
zinc dust paints 343
zinc resin 357