

Subject Index

Please, note that this Index refers to the entry numbers in the Bibliography Section (Vols. 713 and 714). Individual parts of the Bibliography Section (Liquid Column Chromatography, Gas Chromatography, Planar Chromatography and Electrophoresis) are numbered separately.

Liquid Column Chromatography

- Acid-base interactions 2589
 Actin-agarose 4466
 ADP-agarose 703, 708, 810, 2070, 3330, 4475
 Adsorption 1017, 2596, 2616, 3057
 — characteristics 2666
 — coefficient, measurement of 1247
 — equilibrium 2602(review)
 see also Sorption dynamics
 Affi gel 599, 789, 1882, 2802, 3231, 3299, 3365, 4192, 4412, 4462, 4502, 4520
 Affinity chromatography, applications to various fields of science and technology 151, 304, 305, 307, 512, 517, 539, 546, 554, 565, 568, 581, 597, 604, 622, 639, 654, 660-662, 666, 668, 670, 676, 704, 709, 715, 727, 746, 751, 759, 762, 771, 774, 775, 779, 785, 792, 806, 1107, 1214, 1461, 1480, 1483, 1485, 1598, 1666, 1796, 1848, 1866, 1867, 1881, 1882, 1904, 1915, 1919, 1928, 1935, 1966, 1970, 1978, 1987, 1989, 2001, 2044, 2710, 2719, 2802, 2848, 2852, 2957, 3029, 3061, 3128, 3134, 3153, 3154, 3158, 3161, 3164, 3168, 3234, 3236, 3257, 3266, 3271, 3292, 3332, 3334, 3347, 3362, 3385, 3397, 3846, 3848, 3851, 4208, 4380-4382, 4402, 4409, 4416, 4419, 4440, 4467, 4489, 4491, 4501, 4505, 4551
 see also Membrane chromatography; Immobilized metal affinity chromatography, Immunoaffinity chromatography
 — —, combination with immunonephelometry 2957
 — —, coupled with RP HPLC
 — —, frontal using microcolumns 2715
 — —, membrane 148, 1893, 1919, 2031, 2066, 2712, 4102(review), 4417
 — —, models 2718
 — —, new sorbents see Dyes as ligands in affinity chromatography; Stationary phase(s) for affinity chromatography; various kinds of sorbents
 — —, optimization 597
 — —, reviews and books 144-146, 1458, 1460, 1468, 1470, 1471, 1473, 1474, 1479, 1481, 1482, 1484, 1579, 1914, 2717, 4065, 4066, 4178, 4378
 — retardation chromatography 36
 Agglutinin-agarose 616
 Alkyl-agar 1686
 Alkyl-agarose 3393
 Alumina based sorbents 874, 1663, 2648, 2672, 3470, 3745, 3829, 4868
 Amino bonded stationary phases 261, 374, 977, 985, 1571, 1741, 2156, 2879, 3306, 3742, 4449, 4547, 4860
 Aminoethyl-agarose 608, 713, 3193
 Aminohexanoyl-agarose 800
 ω -Aminooctyl-agarose 3267
 AMP-agarose 691, 693
 Amperometric detection see Detection, amperometric
 Annular chromatography 561
 — —, continuous 1851
 Antithrombin III-agarose 292
 Argentation chromatography see Stationary phase, impregnated with silver nitrate; Stationary phase, silver resin
 Arginine-agarose 721, 4430
 Arsenic based affinity chromatography 1866
 Atomic adsorption spectrometry application in LCC see LC/AAS coupling
 ATP-agarose 730
 Automated procedures 114, 176, 199, 204, 227, 473, 567, 845, 1049, 1066, 1074, 1083, 1114, 1357, 1428-1430, 1563, 1580, 1721, 1745, 1765, 1857, 1858, 1980, 2105, 2119, 2189, 2210, 2227, 2230, 2277, 2298, 2336, 2343, 2348, 2393, 2394, 2412, 2421, 2439, 2443, 2573, 2612, 2622, 2687, 2797, 2799, 2929, 2963, 3012, 3013, 3017, 3021, 3053, 3109, 3463, 3504, 3511, 3546, 3578, 3587, 3658, 3663, 3821, 4036(review), 4037, 4132, 4177, 4261, 4307, 4314, 4439, 4732, 4747, 4783, 4800, 4904, 4995, 5010
 see also Sample preparation, automated
 Aza-azophilic chromatography 1878
 Band broadening 2250, 4614
 — dispersion 2684
 Benzamide-agarose 775
 Benzhydroxamic acid - agarose 4486
 Binary-layered phase liquid chromatography 40
 Bioaffinity chromatography see Affinity chromatography, applications to various fields of science and technology
 Bioavailability, modelling 1345
 Books (and symposia proceedings) 3, 1297, 1660, 2756, 3806, 3809, 3910, 3920, 3921
 Boronate ligands for affinity chromatography 370, 1458(review), 1469, 2802, 4478
 Butane-agarose 2003
 Butyl-agarose 2034
 Butyl-cellulofine 740, 4525
 Butyl-Toyopearl 698, 707, 2047, 3337, 4513

- Calibration in chromatography, general 3930, 3933(review)
 see also Data processing
- — gel permeation chromatography see Gel permeation chromatography, calibration
- — steric exclusion liquid chromatography see Gel permeation chromatography, calibration
- Calmodulin-agarose 2070, 3217, 4431, 4497
- Calmodulin-immobilized 2714
- Capacity factor 92, 1094, 1341, 1489, 2608, 3493, 4020, 4789
- Capillary chromatographic techniques 216, 942, 1237, 1357, 1780, 1877, 1996, 2060, 2144, 2728, 2832, 3243, 4323, 4737
- chromatography/MS coupling 942, 1237, 1780, 1877, 1996, 2060, 2144, 4054, 4129, 4381, 4556
- columns see Column(s), microbore and capillary
- hydrodynamic chromatography (CHDC) 3845
- Carbon as sorbent 515, 1308, 1382(review), 1729, 2784, 2830, 3033, 3989, 4002(review), 4655, 4702
- CarboPac 269, 356, 2840, 2867, 2870, 2879, 2888, 2939, 3417, 4188, 4531, 4666
- Casein-agarose 732
- Cellulose based sorbents 82, 1058, 1346(review), 1391, 1396, 1480, 2044, 2406, 2433, 3672, 3703, 3715, 3756, 4084, 4342, 4796
- Centrifugal countercurrent chromatography see Countercurrent chromatography
- partition chromatography 1519, 1548, 2452, 2503, 2755(review), 2756(book), 2763, 3625, 3764(review), 3869, 4097, 4687, 4883
 see also Partition chromatography
- — —, chiral 169
- — —, theory 4097
- Charge transfer chromatography 2315
- Chelation chromatography 2003, 4967
 see also Copper chelate chromatography; Metal chelate chromatography
- Chelexes as stationary phase 2665
- Chemiluminescence see Detection and detectors chemiluminescence
- Chemometrics 43, 209, 342, 1319, 1320, 1418, 1430, 1435, 2533, 2766, 3766, 4045, 4777
- Chiral derivatization 426(review), 458, 471, 1051(review), 1545, 1737-1739, 1766, 1773, 2297, 2306, 3676, 3773, 4338, 4364, 4647
- HPLC see Enantiomers (and diastereomers), separation
- mobile phases 437, 880, 3007, 3770, 4074(review), 4717
- selectors 4844
- sorbents and stationary phases 82, 83, 98, 107, 128, 158, 159(review), 163, 165, 167, 168, 172, 174, 328, 426(review), 434, 1052, 1058, 1078, 1084, 1088, 1102, 1117, 1154, 1377, 1384, 1391, 1395, 1417, 1491(review), 1493, 1496, 1497, 1499, 1500, 1503-1506, 1507(review), 1611, 1623, 1725, 1746, 1767, 2124, 2149, 2267, 2269, 2276, 2291, 2354, 2433, 2654, 2658, 2664, 2675, 2725-2728, 2730-2733, 2737(review), 2738-2741, 2742(review), 2743, 2749-2752, 2893, 3033, 3626, 3636, 3670, 3672, 3703, 3715, 3739, 3756, 3771, 3904, 4003, 4008, 4072, 4073, 4075, 4076, 4081-4085, 4088(review), 4089, 4126, 4234, 4342, 4573, 4577, 4788, 4796, 4843
 see also Cyclodextrin, stationary phase
- Chromatofocusing 715, 717, 1805, 2037, 3284, 3319
- Clean up procedures 132, 433, 1070, 1138, 1153, 1175, 1238(review), 1244, 1490, 1529, 1721, 1752, 2331, 2435, 2818, 3081(review), 3728, 3757, 3850, 4132, 4177, 4286, 4662, 4664(review), 4678, 5013
 see also Solid phase extraction
- CN-bonded phases 1200, 2234, 2418, 3543, 3700, 3775, 4622, 4696, 4757, 4886, 4925
- Co-current chromatography 4100
- Column(s), chiral see Chiral sorbents and stationary phases
- , axial compressed 3988
- , channeling effect 1440(review)
- conditionings 1426
- contamination, preventing 20
- coupling 191, 979, 1195, 1427, 2761, 3756, 3776, 3793, 4134, 4845, 4892, 4896(review)
- design 89
- dispersion coefficients 2591
- , dynamic behavior 3947
- , — coupled 4892
- dynamically compressed 1405, 3988
- equilibria in 2604
- head 1353
- , guard 1487
- , metal-free 2150
- , microbore and capillary 77, 88, 104, 898, 1411, 2583, 2623, 2635, 2642, 2643, 2663, 2679, 2705, 2747, 2892, 2893, 2992(review), 3120, 3460, 3632, 3911(review), 4005, 4019, 4072
 see also Microcolumn
- , new types 2668
- packing 113, 1389, 1405, 2661, 4019, 4032
- , performance 4028
- , Pirkle 2727, 2738, 4754, 4843
- , radial compression 2094, 4025, 4032
- , review 1380, 1392, 1440, 2676
- selectivity see Selectivity
- spin 847
- switching 51, 190, 210, 936, 951, 985, 1099, 1163, 1169, 1189, 1196, 1546, 1563, 1721, 1722, 2087, 2196, 2225, 2240, 2272(review), 2289, 2310, 2360, 2392, 2393, 2436, 2438, 2522, 2929, 2961, 3511, 3542, 3658, 3699, 3707, 3745, 4095, 4288, 4556, 4587, 4627, 4638, 4732, 4754, 4790, 4837, 4838
- treatment (sanitization) 1512
- , variability of 3469
- washing 2563
- Comparison of sorbents see Stationary phase(s), comparison
- Computerization 33, 114-129, 161, 232, 324, 325, 474, 928, 1306, 1312, 1371, 1429-1431, 1433, 1437-1439, 1441, 1442, 1498, 1830, 2421, 2442, 2581, 2597, 2686, 2688-2694, 2696-2700, 2752, 2761, 3929, 4040, 4043, 4045, 4049, 4312
- , review 1436, 2695, 4041
 see also Data processing; Models in chromatography; Retention model
- Concanavalin A-agarose 308, 713, 777, 792, 1934, 1938, 3184, 3288, 3355, 3383, 3388, 3421, 4195, 4203
- -cellulose 2044
- -zirconia 143
- Conductivity detector (and detection) see Detection and detectors conductivity
- Continuous beds 1873, 2060
- chromatography 561, 4031, 4174
 see also Preparative chromatography
- rod 4016

- Copper chelate (affinity) chromatography 4514
 see also Chelation chromatography; Metal chelate chromatography
- Cost analysis 14, 95
- Counteracting chromatographic electrophoresis 562
- Counter-current chromatography 319, 1234, 1668, 3273, 3856, 4094, 4176, 4221, 4934
- — —, enantiomer separation 4080
- — —, high-speed 1521, 2451, 3505, 3805, 4344
- — —, moving bed 4046
- — —, pH-zone-refining 180, 463, 1000, 1610, 2116, 3036, 4347
- — —, preparative 1000, 4080
- — —, review 2551, 2754, 4103
- — —, rotation locular 2746
- — —, semicontinuous 4176
- — —, simulated 2754(review), 4046
- Coupled column chromatography see Columns(s), coupling
- Cyclodextrin, mobile phase 880, 1099, 1495, 1501, 2765, 2774, 2891, 2966, 4087, 4260, 4262, 4575, 4797
- , stationary phase 99, 444, 1154, 1377, 1507(review), 2124, 2130, 2354, 2369, 2654, 2675, 2736, 2926, 3670, 3739, 3985, 4107, 4324, 4577, 4586, 4777
- Data analysis 1312, 2579, 2581
- management 122, 1429, 1431
- processing 115, 807, 2686
- see also Calibration in chromatography, general
- system 129, 1436(review)
- see also Computerization
- Dead volume 2563
- Deconvolution in chromatography 117, 1439
- Derivatization see Post column derivatization; Precolumn derivatization
- , chiral see Chiral derivatization
- , comparison methods 3791
- , fluorescence 65, 205, 237, 248, 253, 338, 348(review), 428, 430, 449, 478, 700, 881(review), 981(review), 985, 1222(review), 1373, 1545, 1556, 1557, 1560, 1562, 1612, 1679, 1715, 1766, 1814, 1925, 2088, 2100, 2126, 2302, 2359, 2628, 2835, 2916, 2931, 2966, 3031, 3078, 3465, 3735, 3737, 3745, 3899, 4160, 4226, 4232, 4260, 4284, 4303, 4307, 4541, 4574, 4744, 4989
- see also Post column derivatization; Precolumn derivatization
- , on-column 4964
- , review 2, 228, 348, 426, 472, 687, 881, 981, 1051, 1222
- see also Post column derivatization; Precolumn derivatization
- , solid phase 2(review), 426(review), 1222(review)
- Desinfection of stationary phase(s) 87
- Detection (and detectors), amperometric 215, 252, 259, 263, 269, 271, 296, 1370, 1420, 1566-1568, 1578, 1697, 1717, 2141, 2839-2841, 2843, 2847, 2873, 2879, 3027, 4152, 4164, 4169, 4170, 4285, 4749, 4977, 4996, 5010
- see also Detection (and detectors), electrochemical
- — —, atomic absorption see LC/AAS coupling
- — —, chemiluminescence 70, 75(review), 868, 881(review), 929, 1105, 1290, 1367, 1368(review), 1373, 1532, 1653, 1658, 1667, 1671, 1722, 1799, 2633, 2906, 2918, 2960, 2984, 2991, 3007, 3052, 3902, 3971(review), 3977, 4138, 4299, 4780
- see also Detection (and detectors), fluorescence
- — —, circular dichroism 60(review), 74
- — —, coulometric electrode-array 2465
- — —, comparison of various types 901
- — —, detection (and detectors), conductivity 322, 346, 827, 1016, 1271, 1614, 2418, 2474, 3034, 3035, 3924, 3978, 4237, 4238, 4240, 4855, 4903, 4906-4908, 4911, 4920, 4945, 4946, 4949, 4973, 4976-4978, 4984, 5000, 5004, 5007, 5012
- — —, coulometric 1120, 1204, 1603, 1717, 2347, 2390, 3014, 3016, 4283, 4776, 4997
- — —, electrochemical 19, 57, 58, 67, 68, 73, 216, 278, 332, 356, 400, 440, 442(review), 443, 444, 480, 881(review), 1059, 1070, 1120, 117, 1546, 1556, 1599, 1624, 1717, 1719, 1720, 1769, 1784, 2012, 2074, 2106, 2121, 2138, 2141, 2169, 2174, 2175, 2206, 2295, 2326, 2353, 2425, 2536, 2641, 2794, 2797, 2888, 2895, 2905, 2977, 2992, 2993, 3002, 3004, 3006, 3010, 3507, 3531, 3591, 3663, 3682, 3702, 3834, 3835, 3967, 4120, 4156, 4172, 4222, 4223, 4254, 4304, 4576, 4632, 4729, 4738, 4746, 4749, 4770, 4776, 4795, 4886, 4909, 4979, 4990, 4994
- see also Detection (and detectors), amperometric
- — —, electrodes 2641
- — —, electron capture 2642
- — —, enzyme 489, 2641
- — —, flame ionization 59, 375, 1654-1656
- — —, — photometric 3473
- — —, flow scintillation see Detection and detectors radioactivity
- — —, fluorescence (luminescence, phosphorescence) 65, 134, 194, 205, 208, 237, 244, 247, 248, 253, 275, 338, 409, 428, 430, 449, 478, 498, 557, 700, 852, 865, 866, 868, 881(review), 900, 902, 914, 985, 989, 1055, 1064, 1075, 1076, 1104, 1108, 1124, 1128, 1129, 1152, 1179, 1184, 1359, 1363, 1373, 1530, 1537, 1556, 1557, 1560, 1562, 1612, 1613, 1617, 1665, 1679, 1684, 1715, 1722, 1741, 1757, 1766, 1788, 1797, 1814, 1925, 2002, 2056, 2087, 2088, 2095, 2100, 2120, 2126, 2137, 2147, 2152, 2192, 2194, 2229, 2276, 2297, 2302, 2303, 2307, 2326, 2328, 2334, 2340, 2355, 2378, 2384, 2391, 2395, 2412, 2414, 2447, 2458, 2466, 2628, 2631, 2632, 2634-2636, 2768, 2777, 2788, 2815, 2821, 2835, 2916, 2966, 3015, 3031, 3032, 3037, 3045, 3049, 3050, 3078, 3435, 3449, 3454, 3465, 3468, 3472, 3476, 3486, 3508, 3511, 3541, 3575, 3585, 3588, 3594, 3651, 3654, 3669, 3684, 3697, 3708, 3726, 3735, 3737, 3744, 3745, 3757, 3757, 3769, 3775, 3781, 3784, 3791, 3837, 3840, 3899, 3966, 3973, 3974, 3979, 3980(review), 4110-4113, 4131, 4132, 4134, 4157, 4160, 4226, 4232, 4249, 4260, 4284, 4286, 4303, 4307, 4324, 4325, 4328, 4341, 4527, 4541, 4555, 4569, 4574, 4623, 4633, 4635, 4644, 4653, 4744, 4754, 4760, 4790, 4808, 4815, 4825, 4830, 4833, 4848, 4861, 4898, 4920, 4928, 4933, 4989
- — —, indirect 1202, 1203, 1614, 2920, 2921, 3034, 3035, 3887, 3888, 3895
- — —, infrared see LC/FTIR coupling
- — —, laser based 134, 208, 1365, 1613, 1757, 2108, 2629, 2631, 2632, 3118, 3612, 3745, 3781, 3965, 3974, 3980(review), 4113
- — —, light scattering 56, 69, 302, 357, 367, 369, 377, 381, 901, 1028, 1032, 1038, 1350, 1360, 1517, 1571, 1572, 1605, 1620, 1642, 1646, 1652, 1661, 1663, 1690, 1692, 1698, 2245, 2251, 2255, 2257, 2260, 2629, 2820, 2868, 2909, 2932, 2948, 2952, 3118, 3612, 3613, 3872, 3965, 4252, 4915, 4917
- — —, NMR see LC/NMR coupling
- — —, noise 1361, 1372
- — —, on column 19, 2635
- — —, optimization 187
- — —, photodiode array 63, 130, 131, 210, 218, 223, 317, 350, 423, 509, 646, 866, 867, 897, 903, 970, 998, 1011, 1212, 1221,

- 1306, 1531, 1552, 1605, 1608, 1617, 1692, 1760, 1802, 2011, 2130, 2152, 2215, 2217, 2230, 2238, 2242, 2444, 2454, 2624, 2626, 2901, 3071, 3091, 3108, 3497, 3576, 3578, 3648, 3747, 3780, 3788, 3803, 3824, 3838, 4125, 4359, 4607, 4666, 4670, 4689, 4745, 4791, 4811, 4871, 4875, 4881
- Detection (and detectors), photoionization 2643
- — —, photolysis-fluorescence 1128
 - — —, photometric 3822(review), 3969(review)
 - — —, —, indirect 1202, 4981
 - — —, —, polarized 2640
 - — —, polarimetric 64, 2639
 - — —, post column reaction see Post column derivatization
 - — —, potentiometric 61, 1364, 1370, 1570, 2625
 - — —, radioactivity 316, 343, 351, 354, 731, 1522, 1625, 1657, 1690, 1736, 1743, 1807, 2309, 2901, 2942, 3640, 3662, 4182, 4819
 - — —, radioluminescence 3976
 - — —, reaction see Post column reaction detection
 - — —, refractometric 202, 207, 321, 327, 355, 373, 376, 384, 406, 1232, 1251, 1432, 1574, 1644, 1662, 1990, 2482, 4168, 4246, 4698
 - — —, review, general 1369, 2630, 3822, 3968-3971
 - — —, sensitivity 46
 - — —, spectra UV, derivative 4359
 - — —, spectrophotometric see Detection (and detectors), photometric
 - — —, test 62
 - — —, thermal lens 71, 2637
 - — —, viscosity 2260, 2868
- Detector(s) cell 88, 3975, 4325
- , new designs 57, 1362
- Diastereoisomers, separation see Enantiomers (and diastereomers), separation
- Diffusion, lateral 1326
- Diode array detection see Detection (and detectors), photodiode array
- Dispersion coefficients 2591
- Displacement chromatography 30, 2609, 2903, 3020, 3065, 3075, 4943
- — —, automated 1857, 1858
 - — —, chiral 1494, 1502
 - — —, column efficiency 3953
 - — —, displacers 30, 3928
 - — —, ion exchange 1305, 3115, 3928, 4379
 - — —, theory 3953
- DNA-agarose 142
- DNA-cellulose 3115, 4406
- Droplet countercurrent chromatography see Countercurrent chromatography
- Dye ligand chromatography, differential 3397
- Dyes as ligands in affinity chromatography 151, 547, 587, 668, 727, 1462, 1463, 1477, 1478, 2667, 4506, 4519
- see also Stationary phase(s) for affinity chromatography
- Elastin-agarose 783
- Electrochemical detection see Detection (and detectors), electrochemical
- detector see Detection (and detectors), electrochemical
- Electrochromatography 175, 176, 184, 1513, 4093
- Electrokinetic chromatography see entries under Capillary zone electrophoresis within the section on electrophoresis
- Electrostatic chromatography 179
- Enantiomers (and diastereomers), separation 74, 83, 125, 128, 156-174, 205, 328, 359, 434, 436, 437, 458, 461, 471, 509, 870, 880, 917, 940, 1052, 1058, 1062, 1064, 1068, 1069, 1075, 1078, 1084, 1088, 1090, 1099, 1102, 1103, 1106, 1117, 1126, 1154, 1171, 1185, 1384, 1493-1506, 1545, 1610, 1611, 1623, 1630, 1725, 1737-1739, 1746, 1753, 1766, 1767, 1773, 1776, 1785, 1788, 1800, 1811, 2086, 2124, 2149, 2267, 2269, 2276, 2281, 2282, 2291, 2297, 2299, 2302, 2303, 2305, 2306, 2315, 2337, 2344, 2349, 2354, 2403, 2433, 2608, 2654, 2658, 2691, 2724-2733, 2735, 2736, 2738-2741, 2743, 2745-2752, 2765, 2893, 3007, 3033, 3087, 3361, 3471, 3494, 3558, 3626, 3633, 3635, 3636, 3638, 3642, 3661, 3670, 3672, 3673, 3676, 3686, 3697, 3703, 3705, 3706, 3715, 3739, 3756, 3770, 3771, 3773, 3904, 4072, 4073, 4075, 4078-4087, 4089, 4090, 4122, 4126, 4140, 4146, 4234, 4262, 4316, 4326, 4328, 4338, 4364, 4563, 4573, 4575, 4577, 4584-4586, 4609, 4647, 4672, 4706, 4717, 4733, 4736, 4750, 4754, 4756, 4758, 4761, 4764, 4769, 4773, 4788, 4791, 4796, 4797, 4838, 4843, 4844
- — —, comparison with capillary electrophoresis 4586
 - — —, database 161
 - — —, optimization 3626
 - — —, preparative 871, 2233, 4342
 - — —, reviews 157, 1051, 1491, 1492, 1507, 2734, 2737, 2742, 2744, 3549, 3623, 3634, 3675, 4070, 4071, 4074, 4077, 4088, 4091, 4709, 4720, 4721
- Equations see various kinds of equations
- Equilibria in chromatography columns 2604
- Error, analysis, control of 4897
- Expert system(s) 128, 1293(review)
- Extraction chromatography 2440, 2753, 3906, 4944, 4951, 4953, 4961
- Fast (protein) chromatography (FPLC) 586, 642, 717, 738, 774, 833, 1868, 1871, 1966, 1978, 2972, 3145, 3194, 3271, 3285, 3318, 3325, 4168, 4181, 4207, 4210, 4214, 4350, 4438, 4519, 4533
- — —, comparison with HPLC 4450
 - Fourier transformation see LC/FTIR coupling
- Field-flow fractionation 177, 282, 1033, 1261, 1263, 1517, 2489, 2757, 4010, 4932
- Filters, silica gel 3994(review)
- Fingerprinting see under structural studies in individual entries in the List of Types of Compounds Chromatographed
- Flame ionization detector see Detection (and detectors), flame ionization
- Flash chromatography 1990, 4082, 4621
- Florisil 2475
- Flow influences 2212, 3120, 4086, 4387
- Fluorescence detection see Detection (and detectors), fluorescence
- detector see Detection (and detectors), fluorescence
 - labelling see Derivatization, fluorescence
- Frontal analysis 559, 2748, 4375
- Functional analysis 1486
- Gel fibreglass as support for affinity chromatography 2682
- Gel permeation chromatography, calibration 44, 45, 1342, 1349, 2599, 2863
- — —, combination with GC 132
 - — —, comparison with MALDI 3610
 - — —, coupling with field-flow fractionation 4700
 - — —, — — MS 4349
 - — —, high temperature 1036, 3620

- Gel permeation chromatography, interactions polymer-solvent-stationary phases 4692
 — — —, mobile phase 4698
 — — —, models 34
 — — —, molecular mass estimation 44, 45, 1013, 1019, 1025, 1029, 1252, 1584, 1862, 2253, 2256, 3611, 3612, 4184, 4432, 4693, 4922
 — — —, optimization 1313
 — — —, reviews and books 6, 8, 361, 1375, 2578, 3129, 3820, 3914, 3921, 3960, 4151, 4377
 — — —, stationary phase(s) 96, 1262
 — — —, stochastic analysis of dispersion 3956
 — — —, theory 1013
 Gelatin-agarose 2068, 3377
 Glass, porous 589, 1262, 1588, 4018
 — — —, glutaraldehyde activated 4018
 Glucosamine-agarose 739
 Glutathione-agarose 3195, 3292, 3304
 Gradient(s), inverse 510
 — multiplex chromatographic method 3055
 —, pH 3943, 4426
 Heparin-agarose 387, 496, 517, 581, 673, 677, 680, 728, 748, 751-753, 758, 759, 761, 763, 780, 793, 811, 1938, 2040, 2058, 3061, 3220, 3223, 3297, 3314, 3315, 3323, 3328, 3340, 3368, 3384, 4451, 4494, 4502, 4504, 4508, 4509
 Heparin-Toyopearl 3378
 Hexyl-agarose 686
 Hexylamide-agarose 3268
 High speed chromatography 1294(review), 4332(review), 4719
 Histidine-ligand affinity chromatography 1481(review)
 History of chromatography 15, 2556(review), 3925
 HSA immobilized 465, 3168
 Hydrophilic interaction chromatography 4150(review)
 Hydrophobic interaction chromatography 298, 542, 549, 553, 709, 747, 1040, 1316(review), 1351, 1595, 1686, 1869, 1889, 1909, 1912, 1914(review), 1938, 1985, 2015, 2061, 2468, 2565, 2944, 3113, 3114, 3126, 3268, 3278, 3434, 4196(review), 4507
 — — —, preparative 4024
 — — —, selection 2565
 — — —, stationary phases 2565
 — — —, theory 1324
 Hydrophobicity 3955, 4583
 Hydroxyapatite 363, 417, 575, 609, 663, 677, 683, 690, 692, 699, 717, 733, 743, 761, 793, 804, 808, 809, 811, 1260, 1378, 1668, 1889, 1890, 1903, 1938, 1958, 2029, 2061, 2649, 3187, 3239, 3251, 3260, 3267, 3270, 3274, 3299, 3378, 3394, 3416, 3434, 3438, 4477, 4483, 4487, 4502, 4532, 4536
 Hyphenation techniques 2706
 — see also individual types of hyphenated techniques
 IgG-agarose 764, 2878, 3335, 3344
 IgM-agarose 4213
 Immobilized Ag(I) chromatography 4311
 — chelating agent 3908(review)
 — enzymes 1472, 2708, 3266, 3298, 3388
 — ligand affinity chromatography 3993
 — see also individual types of affinity sorbents
 — membrane support see Membrane, immobilized
 — metal ion affinity chromatography 152, 659, 1468(review), 1789, 1947, 2500, 3169, 3257, 3258, 4384, 4415
 — — — — partitioning 707
 Immobilized metal ion chromatography 2776, 3039
 — protein (peptide) stationary phase 1460(review), 1465, 1491(review), 1493, 1499, 1503, 1505, 1935
 — see also individual types of affinity sorbents
 Immunoaffinity chromatography 176, 386, 595, 669, 705, 1231, 1480, 1897, 1922, 1933, 1980, 2043, 2069, 2226, 2227, 2458, 2713, 2813, 3175, 3216, 3348, 3410, 3922, 4134, 4387, 4548, 4658
 — — —, coupling with RP LC 2227
 — — —, frontal 566
 — — —, membrane 4413
 — — —, reviews 146, 2709
 — clean up 2821, 4132
 Inclusion chromatography 2608, 4260
 Infrared detector (and detection) see LC/FTIR coupling
 Injectors 46
 Instrumentation for liquid column chromatography 46-55, 1352-1358, 1457, 2618-2622, 3917(review), 3961-3963
 Integration errors 2683
 — parameters 1314
 Interaction chromatography see Ion interaction chromatography
 Ion and ion pair chromatography 178, 179, 256, 278, 336, 246, 465, 483, 532, 889, 969, 1080, 1104, 1175, 1190, 1201-1203, 1250, 1267, 1269, 1271, 1274, 1278, 1285, 1287, 1289, 1608, 1624, 1654, 1721, 1758, 1791, 1931, 2076, 2091, 2094, 2104, 2127, 2138, 2148, 2166, 2209, 2234, 2238, 2290, 2304, 2309, 2341, 2365, 2372, 2408, 2429, 2474, 2483, 2488, 2502, 2509, 2512, 2521-2523, 2526-2528, 2532, 2535, 2538, 2540, 2544, 2572, 2627, 2846, 2899, 2915, 2917, 2918, 2920, 2921, 3405, 3408, 3411, 3420, 3466, 3472, 3528, 3546, 3570, 3622, 3643, 3650, 3741, 3762, 3768, 3823, 3860, 3863, 3878, 3886-3897, 3901, 3997, 4160, 4229, 4235, 4237, 4238, 4281, 4288, 4297, 4569, 4587, 4680, 4719, 4812, 4821, 4822, 4850, 4855, 4878, 4900, 4901, 4903-4911, 4929, 4935, 4945, 4946, 4948, 4949, 4954, 4956, 4959, 4964, 4969-4971, 4973, 4976, 4979, 4980, 4984-4988, 4992, 4997, 4998, 5001, 5004, 5007-5009, 5013, 5014
 — — — — —, comparison with capillary (ion) electrophoresis 278, 1614, 2538
 — — — — —, — — other analytical techniques 3931
 — — — — —, chiral 870, 4721(review)
 — — — — —, coupling with AES 1280, 1282
 — — — — —, — — ion exclusion chromatography 4995
 — — — — —, — — MS 4954
 — — — — —, detection 61, 2627, 3978
 — — — — —, enantiomers separation 1171
 — — — — —, matrix-elimination 4900
 — — — — —, mixed 3405
 — — — — —, non-suppressed 3900, 3903, 3935, 4988, 5009
 — — — — —, optimization 889, 969
 — — — — —, preparative 4034, 4557, 4560, 4561
 — — — — —, retention prediction 1327
 — — — — —, reviews and books 5, 102, 1224, 1292, 1298, 2525, 2549, 3882, 3913, 3920, 4721, 4968
 — — — — —, theory 3927
 — exchange chromatography, reviews 2469, 4215
 — — —, enantiomers 4122
 — — —, mobile phase, nonaqueous 3924
 — — —, model 2605, 4312
 — — —, theory 2603
 — exchangers, dynamically modified 4962

- Ion exchangers, membrane 1884, 3215
 — —, new types 548, 1419, 1567, 2060, 2669, 3112, 3999, 4016, 4962
 — —, regeneration 4000
 — —, review(s) 2662
 — —, zwitterion 4006
 — exclusion chromatography 1712, 2598, 2625, 3902, 3903, 4154, 4240, 5010
 — — —, coupling with ion chromatography 4995
 — interaction chromatography 1286, 2504, 2531, 2533, 2566, 2994, 3870
 — pair extraction 2194, 2351, 3825, 4557, 4560, 4561, 4587, 4904
 — pairing modifiers 17, 483, 889, 2234, 2365, 3411
 see also Mobile phase modifiers
 Ion suppression HPLC, reversed phase 1618
 Isotherm 1329
 Lactosyl-agarose 660
 Laser based detection and detectors *see* Detection and detectors, laser based
 Layer-system liquid chromatography 4104(review)
 LC/AAS (atomic absorption spectrometry) coupling 1277, 1281, 1443, 2518, 3489, 3858, 3859, 3864, 3883, 4064(review), 4597
 LC/AA (atomic spectrometry) coupling 4052
 LC/AES (atomic emission spectrometry) coupling 1280, 1282, 1862, 3884, 4064(review), 4596
 LC/BA (protein binding assay) coupling 3509
 LC/capillary electrophoresis coupling 1453
 LC, combination with biochemical detection (BCD) 1515
 —, — — electrophoresis, two dimensional 1877
 —, — — EPR 200
 —, — — field-flow fractionation 4700
 —, — — GC 132, 196, 203(review), 204, 405, 990
 —, — — immunoassay 2796, 3972(review)
 —, — — isotachopheresis, capillary 1450
 —, — — magnetic resonance imaging 66
 —, — — microdialysis 1508, 2720, 3632, 4358
 —, — — polarization fluoroimmunoassay 3557
 —, — — Raman spectrometry 4927
 —, — — TLC 4681
 —, comparison of LC methods 2897, 3028, 3758, 4450
 —, — with bioassay 3721
 —, — — capillary electrophoresis 14, 125, 176, 224, 259, 278, 830, 978, 1045, 1121, 1181, 1614, 1615, 2075, 2862, 2888, 3121, 3664, 3821, 4334(review), 4443, 4454, 4586, 4591, 4797, 4798, 4818, 4851, 4874, 4893, 4982, 4987
 —, — — electrophoresis 2089
 —, — — enzymatic method, micro 2839
 —, — — enzyme immunoassay 2222
 —, — — GC 451, 1077, 2217, 2779, 3054, 4139, 4741
 —, — — immunoassay 4725
 —, — — MALDI 3610
 —, — — monoclonal fluorescence polarization immunoassay 2432
 —, — — other analytical methods 14, 219, 240, 629, 955, 1142, 1208, 3197, 3931, 4982
 —, — — — chromatographic methods 3785, 3832(review)
 —, — — spectrophotometry 1010, 2831
 —, — — supercritical fluid chromatography 972, 1424
 —, — — TLC 14, 1039, 2817, 2891, 2980, 3424, 3811, 3957, 4124, 4559
 —, — — voltammetric method 2506
 LC, comparison with volumetric method 4906
 — coupling, general, review 135
 — electro dialysis coupling 1745
 LC/ELISA coupling 2420, 3461, 3754, 4548
 LC/FTIR coupling 133, 140, 2257, 2962
 LC/GC coupling 2618, 2936(review), 2985, 4057(review), 4098
 LC/MALDI coupling 3615
 LC/MS coupling 77, 108, 130, 138, 139, 186, 198, 265, 330, 380, 398, 399, 449, 460, 508, 523, 530, 532, 536, 550, 600, 684, 820, 838, 839, 855, 863, 873, 885, 924, 925, 927, 935, 942, 945, 962, 967, 974, 982, 1014, 1048, 1050, 1064, 1087, 1098, 1100, 1124, 1130, 1133, 1142, 1180, 1183, 1192, 1237, 1239, 1243, 1272, 1283, 1358, 1444, 1445, 1448, 1451, 1454, 1455, 1457, 1535, 1634, 1641, 1649, 1695, 1728, 1743, 1760, 1772, 1775, 1780, 1819, 1824, 1841, 1849, 1850, 1861, 1877, 1985, 1996, 2053, 2060, 2073, 2077, 2117, 2128, 2143, 2144, 2183, 2185, 2191, 2211, 2221, 2233, 2258, 2265, 2271, 2281, 2282, 2303, 2324, 2353, 2357, 2362, 2368, 2377, 2385, 2402, 2411, 2416, 2423, 2446, 2462, 2470, 2521, 2687, 2701-2705, 2776, 2889, 2925, 2946, 2960, 2968, 2976, 3003, 3092, 3105, 3162, 3218, 3243, 3304, 3372, 3445, 3467, 3487, 3492, 3500, 3538, 3567, 3570, 3576, 3581-3583, 3587, 3615, 3641, 3646, 3647, 3701, 3704, 3714, 3723, 3746, 3758, 3779, 3786, 3792, 3803, 3824, 3827, 3837, 3840, 3850, 3855, 3858, 3859, 3871, 4054, 4063, 4129, 4130, 4242, 4255, 4265, 4338, 4349, 4381, 4453, 4556, 4601, 4605, 4613, 4630, 4632, 4654, 4659, 4667, 4676, 4689, 4716, 4718, 4726, 4742, 4751, 4792-4794, 4809, 4819, 4829, 4877, 4916, 4941, 4954
 —, comparison with FIA/MS 1142
 —, reviews 137, 1241, 1295, 1446, 1447, 1449, 1452, 1456, 2461, 2707, 4053, 4055, 4058, 4059, 4062, 4064, 4385, 4863
 LC/NMR coupling 72, 136, 4050(review), 4051, 4218, 4802
 LC/OES coupling 1283, 2518, 3490, 3852
 LC/RIA coupling 489, 514, 1673, 4747
 LC/SFC (supercritical fluid chromatography) coupling 1539, 2764
 LC/TLC *see* LC, combination with TLC
 Lectins, immobilized 141, 147, 305, 593, 792, 1483, 2711, 3347, 4178(review)
 Lentil-lectin agarose 745, 2887
 see also Affinity chromatography
 Light scattering detection and detectors *see* Detection (and detectors), light scattering
 Liquefied gases as mobile phase *see* respective entries under Supercritical fluid chromatography in the section on Gas chromatography
 Liquid-gel partitioning 4114
 Liquid-liquid extraction 953, 1529, 2224, 2344, 2389, 2411, 2435, 2513, 3081(review), 3728, 3826, 4840, 4850
 — chromatography 4100
 — partition chromatography 4471
 Liquid scintillation counting *see* Detection (and detectors), radioactivity
 Liquid-solid extraction 4800
 Lysine-agar 1666
 Lysine-agarose 2021, 3299, 3383
 Lyso phosphatidylcholine ligands 1403
 Lysozyme, immobilized 1598
 Matrix solid phase dispersion (MSPD) extraction 3732
 Membrane chromatography 559, 734, 1880, 1968, 3110, 4388

- Membrane chromatography, affinity 148, 1893, 1919, 2031, 2066, 2712, 4102(review), 4417
— —, immunoaffinity 4413
— —, ion-exchange 1884, 3215
— —, plate heights 3949
— —, preparative 110
— —, theory 3949
— convective liquid chromatography 97(review)
—, immobilized artificial 1347, 2274, 3131, 4417
—, review 4101
- Metal affinity chromatography 4067
— — displacement chromatography 1868
— chelate chromatography 435, 580, 620, 2150, 2511, 4514
 see also Chelation chromatography; Copper chelate chromatography
- Method development 1314, 2690
— selection 1315, 2577
- Methoxyethoxymethyl-agarose 3851
- Micellar chromatography 21, 71, 90, 92, 181, 182, 1249, 1338, 1525, 1528, 1533, 1549, 2205, 2261, 2284, 2759, 3450, 3452, 3717, 3781, 3796, 3855, 3945, 4017, 4296, 4355, 4571, 4734, 4999
 see also Capillary chromatography, micellar in the Electrophoresis section
— —, stationary phase(s) 90, 92, 1549
— —, theory 3940, 3945
- Microbore (narrow bore) columns see Columns, microbore and capillary
- liquid chromatography 57, 176, 183, 438, 684, 1046, 1304(review), 1508, 1707, 2134, 2152, 3632, 3961, 4322, 4372, 4403, 4576, 4781
- Microcolumn 197, 1495, 1647(review), 2547(review), 2635, 3526, 4112, 4324, 4381, 4981
 see also Columns, microbore and capillary
- Microcystin-agarose 3332, 4505
- Microdialysis 47, 1110, 1508, 1777, 2720, 3632
- Miniaturization of chromatography 2580, 2583
- Mobile phase(s), buffer see pH effect
— —, chiral see Chiral mobile phase
— —, degassing 50, 2563
— — effects 31, 32, 1094, 1317, 1333, 1394, 1500, 1513, 1549, 1813, 2566, 2584, 2808, 2921, 2969, 3113, 3114, 3126, 3446, 3447, 3935, 3944, 4713
— —, filter 1356
— —, fluidity enhanced 1509, 4099
— —, micellar 38, 1249, 1549, 4017
— — modifiers 32, 38, 1094, 1627, 2264, 2519, 2566, 2567, 2625, 3855, 3897, 3932, 4991
 see also Ion pairing modifiers
— — optimization, 38, 232, 928, 969, 1002, 1607, 2111, 2148, 2264, 2290, 2341, 2433, 2504, 2582, 2699, 2725, 2751, 2798, 3405, 3766, 3855, 3924, 3932, 4020, 4424, 4507, 4527, 4918, 4978, 4988
— — pH variants 2603
— — problems 2561, 2562
— —, properties 2584, 2585, 3936
— —, recycling 129, 1423, 2562
— —, review 2552
— —, selectivity
— — strength 3126, 3130, 3932, 4020
— — temperature see Temperature effects
- Models in chromatography 25, 27, 28, 34, 119, 121, 123, 126, 127, 170, 188, 1331, 1332, 1345, 1432, 1439, 1586, 2249, 2253, 2290, 2341, 2533, 2605, 2685, 2691, 2718, 2752, 2761, 3062, 3114, 3122, 3156, 4040, 4042, 4043, 4047, 4068, 4086, 4312, 4376, 4383
— — —, review 2695
 see also Computerization; Retention model
- Molecular dynamics of chromatography 1334
- Molecular mass estimation 44, 45, 282, 1013, 1019, 1025, 1027, 1029, 1032, 1252, 1584, 1863, 2253, 2256, 3611, 3612, 4117, 4184, 4432, 4693, 4922
 see also Gel permeation chromatography, molecular mass estimation
- Monitoring of chromatographic procedures see Detection (and detectors)
- Moving-bed chromatography 2620
— —, simulated 2620, 3836, 4039, 4044, 4046, 4086, 4140
— —, pseudo 2588
- Multi-column chromatography see Column coupling
- Multidimensional chromatography 567, 866, 1410, 1544, 1581, 2227, 2855, 2859, 2860, 3434, 3511
 see also Column(s) switching
- Ni-affinity chromatography 1966, 3275
- Nickel-NTA column 1464, 4488
- Nonlinear chromatography 29, 1433
— coupled chromatography system 2600
— elution 4376
- Non-suppressed ion chromatography 3900, 3903, 3925
- Octyl-agarose 745, 1592, 2949, 3391, 4212, 4532
- Octylamine-agarose 699, 4472, 4477
- Oligosaccharide mapping see under structural studies in individual entries in the List of Types of Compounds Chromatographed
- On-line-processes see individual LC coupling techniques
- Open tubular liquid chromatography 2832
- Optical chromatography 3926
- Optimization 22, 33, 38, 187, 188, 223, 232, 474, 546, 597, 614, 889, 928, 969, 1002, 1042, 1313, 1430, 1441, 1524, 1607, 1783, 1791, 1825, 1853, 2111, 2148, 2182, 2264, 2275, 2278, 2290, 2304, 2341, 2433, 2441, 2442, 2533, 2582, 2689, 2699, 2725, 2751, 2766, 2798, 2999, 3069, 3283, 3405, 3626, 3757, 3766, 3797, 3855, 3924, 3932, 4020, 4040, 4045, 4049, 4086, 4303, 4380, 4414, 4424, 4453, 4507, 4527, 4578, 4586, 4609, 4671, 4913, 4918, 4978, 4988
— —, review 4, 1051, 2548, 3123
— —, using TLC data 2582
 see also various types of chromatography, optimization
- Organic modifiers see Mobile phase modifiers
- Ovomucoid column 2303, 4076
- Partition chromatography 2587, 3905
 see also Centrifugal partition chromatography
— —, ion moderated 1606, 4175
— — coefficient 39, 1341, 1347, 2617, 3493, 3625, 3958, 3959, 4753
- Partitioning, affinity 707
— —, modeling 1345
- Peak(s) asymmetry 1439, 1503
— broadening see Band broadening
— classification 2581
—, distorted 2570
—, overlapping 117, 1325(review), 1422, 2683, 3942
— purity 2557, 3970(review)

- Peak shape 1331, 1439, 3932, 3948
 — size 3933(review)
 —, solvent 3923
 —, system 29, 212, 1318, 2587, 2735, 3934, 3935
 — tailing 1393
 Pentyl-agarose 4524
 Pepstatin A-membrane 2066
 Peptide mapping see under structural studies in individual entries in the List of Types of Compounds Chromatographed
 Perfusion chromatography 1518, 4028
 pH effect 952, 1057, 1094, 1394, 1500, 1504, 1513, 1607, 1636, 1758, 1882, 2097, 2111, 2264, 2341, 2365, 2511, 2603, 2613, 2725, 2751, 2921, 2975, 2994, 3477, 4020, 4275, 4988
 see also Mobile phase
 pH gradient 3943, 4426
 Phenyl-agarose 417, 696, 712, 722, 730, 733, 743, 745, 755, 758, 770, 776, 780, 790, 792, 808, 809, 813, 815, 1865, 1903, 1944, 1991, 2003, 2008, 2009, 2029, 2040, 2064, 3259, 3261, 3291, 3299, 3380, 3388, 3392-3394, 4412, 4464, 4487
 Phenyl-Toyopearl 3378
 Phosphorescence detection see Detection (and detectors), fluorescence
 Photochemical reactions 3744
 Photoconductivity detection (and detectors) see Detection (and detectors), conductivity
 Photodiode array detector see Detection (and detectors), photodiode array
 Pirkle column see Column(s), Pirkle
 Plate heights 39949
 Polarimetric detection see Detection (and detectors), polarimetric
 Polylysine-agarose 616, 3178, 3307, 4466
 Poly(L-proline)-agarose 3219
 Porous glass see Stationary phase(s), glass
 Post column derivatization 65, 228(review), 244, 473, 687(review), 937, 981(review), 998, 1104, 1140, 1748, 2095, 2307, 2388, 2458, 2539, 2931, 3007, 3045, 3508, 3528, 3735, 3839, 3870, 3878, 4291(review), 4295, 4574, 4611, 4644
 — — chelation 3541
 — — complexation 4923
 — — ion pair extraction 2194
 — — reaction detection 70, 929, 1105, 1366(review), 1578, 1590, 2161, 2328, 2535, 3509, 4900, 4971
 — — reactors 3473, 4345, 4933
 Potentiometric detection (and detectors) see Detection (and detectors), potentiometric
 Precipitation chromatography 1024
 Precision in column chromatography 1421, 3011
 Precolumn derivatization 2(review), 65, 205, 237, 248, 253, 315, 338, 348(review), 426(review), 428, 429(review), 430, 432, 449, 451, 454, 458, 464-466, 470, 471, 472(review), 476, 478, 687(review), 801, 877, 981(review), 985, 1051(review), 1063, 1078, 1162, 1169, 1185, 1265, 1268, 1373, 1545, 1556, 1557, 1560, 1562, 1563, 1580, 1612, 1613, 1615, 1616, 1659, 1679, 1715, 1718, 1721, 1732, 1737-1739, 1741, 1751, 1756, 1760, 1762, 1766, 1773, 1786, 1807, 1814, 1821, 1925, 2088, 2126, 2138, 2197, 2291, 2359, 2391, 2410, 2628, 2636, 2790, 2835, 2837, 2896, 2916, 2919, 2933, 2953(review), 2966, 2995, 2998, 3001, 3006, 3012, 3013, 3017, 3018, 3021, 3025, 3026, 3031, 3032, 3037, 3049, 3078, 3083, 3087, 3465, 3472, 3663, 3684, 3717, 3737, 3745, 3749, 3757, 3773, 3784, 3791, 3802, 3830, 3899, 3974, 4145, 4160, 4161, 4226, 4232, 4242, 4250, 4260, 4284, 4294, 4299, 4303, 4307, 4315, 4316, 4326, 4338, 4364, 4541, 4543, 4547, 4744, 4754, 4864, 4989
 see also Chiral derivatization; Derivatization, fluorescence
 Preconcentration see Sample, preconcentration
 Prediction see Retention prediction
 Preparative (and semipreparative) chromatography 109-113, 254, 374, 871, 914, 1000, 1158, 1423, 1424, 1536, 1538, 1553, 1610, 1761, 1783, 1852, 1864, 1874, 1948, 2017, 2232, 2237, 2345, 2495, 2684, 2842, 2928, 2981, 3173, 3193, 3481, 3499, 3563, 4024-4029, 4031, 4032, 4034, 4080, 4086, 4185, 4227, 4271, 4276, 4383, 4390, 4403, 4418, 4557, 4560, 4561, 4842
 see also various kinds of chromatography
 — —, counter-current 1000
 — —, displacement 110, 112
 — —, enantiomer separation 871
 — —, hydrophobic interaction chromatography 4024
 — —, ion 4034
 — —, membrane 110
 — —, modeling 4042
 — —, optimization 1783, 4049
 — —, reviews 1425, 3909, 3912, 3914, 3917, 3918, 4030, 4033
 — —, stationary phase(s) 105, 1385, 1386, 1405, 4016, 4390
 PRISMA optimization 223
 Programs for chromatography see Computerization
 Protamin-agarose 2027
 Protein A - agarose 669, 764, 767, 799, 1964, 1978, 2008, 2856, 3242, 4451, 4531
 Protein G - agarose 2939, 3478, 4414
 Protein-Pak 517, 686, 770, 3071, 3270, 3337, 3395, 3828
 Pumps 46, 3961
 Quantitation 119, 191, 210, 223, 239, 243, 248, 253, 259, 264, 271, 317, 332, 350, 368, 397, 419, 438, 443, 444, 453, 473, 476, 478, 581, 610, 837, 858, 861, 865, 866, 877, 879, 882, 895, 898, 919, 934, 953, 970, 985, 990, 1045, 1055, 1062, 1067, 1070, 1072, 1076, 1092, 1096, 1100, 1104, 1105, 1108, 1113, 1120, 1128, 1138, 1140, 1148, 1153, 1159, 1162, 1164, 1165, 1169, 1172, 1175, 1183, 1185, 1189, 1220, 1279, 1318, 1421, 1422, 1524, 1529, 1552, 1557, 1563, 1570, 1587, 1606, 1615-1617, 1642, 1652, 1659, 1675, 1678, 1679, 1683, 1692, 1696, 1697, 1704, 1715, 1716, 1721, 1722, 1724, 1734, 1748, 1751, 1752, 1762, 1814, 1897, 2002, 2073-2075, 2084, 2094, 2095, 2117, 2120, 2121, 2127, 2133, 2137, 2138, 2140, 2145, 2175, 2180, 2189, 2190, 2196, 2210, 2213, 2217, 2224, 2241, 2279, 2295-2297, 2300, 2302, 2303, 2307, 2310, 2317, 2320, 2326, 2339, 2344, 2347-2349, 2351, 2355-2357, 2360, 2362, 2364, 2374, 2378, 2380, 2384, 2386, 2388, 2389, 2391, 2392, 2394, 2395, 2401, 2412, 2414, 2418, 2425, 2427, 2431, 2433, 2435, 2436, 2438, 2442, 2447, 2450, 2458, 2467, 2478, 2505, 2536, 2538, 2540, 2548(review), 2601, 2683, 2725, 2777, 2779, 2781, 2787, 2790, 2797, 2807, 2809, 2810, 2821, 2892, 2918, 2931, 2951, 2980, 2984, 2993, 2995, 3000, 3001, 3018, 3026, 3037, 3067, 3406, 3441, 3454, 3463, 3470, 3472, 3492, 3504, 3511, 3514, 3525, 3528, 3546, 3624, 3627, 3644, 3656, 3662-3664, 3667, 3670, 3682, 3684, 3686, 3691, 3693, 3696, 3697, 3701, 3705, 3707, 3739, 3740, 3742, 3747-3749, 3752, 3753, 3756-3758, 3766, 3769, 3772, 3775, 3776, 3784, 3800, 3801, 3824, 3826, 3864, 3896, 3978, 4023, 4125, 4131, 4132, 4136, 4138, 4155, 4177, 4180, 4186, 4222, 4233, 4252, 4303, 4306, 4307, 4309, 4351, 4358, 4440, 4447, 4454, 4541, 4545, 4556, 4567, 4576, 4599,

- 4603, 4604, 4611, 4627, 4633, 4638, 4639, 4641, 4671, 4677-4680, 4683, 4712, 4730-4733, 4735-4737, 4742, 4746, 4747, 4757, 4758, 4760, 4761, 4764, 4770, 477-4776, 4780-4783, 4785, 4792, 4799, 4800, 4805-4807, 4812, 4815, 4828, 4830, 4831, 4833, 4836, 4838-4840, 4845, 4848-4850, 4855, 4859-4861, 4869, 4874, 4875, 4877, 4878, 4886, 4888, 4897, 4903, 4905, 4906, 4908-4911, 4914, 4935, 4940, 4946, 4954, 4969, 4971, 4973, 4976, 4979, 4982, 4984, 4990, 4993, 4996, 5004, 5007
- Quantitative structure-activity relationships (QSAR) 39, 2613, 4583, 4789
- Quantitative structure-properties relations (QSPR) 2612
- Radial flow chromatography 2684
see also Preparative (and semipreparative) chromatography
- Radiation pressure as separation principle 3926
- Radioactivity detection (and detectors) see Detection (and detectors), radioactivity
- Radiochromatography see Detection (and detectors), radioactivity
- Reaction chromatography 3952
- Reactors, co-immobilized enzyme see Post column reactor
- , reverse flow 4096
see also Post column reactors
- Receptor-affinity chromatography 1471(review)
- Refractometric detector see Detection (and detectors), refractometric
- Relationship between retention and structure see Structure-retention relationships
- Resolution 2553(review), 2581, 2592
- Retention 1309, 1311, 1328, 2553(review), 2638, 3984
— behavior 1015, 1021, 2575, 2891, 4260
— characteristics 1393, 2638, 4703, 4704
—, electrochemically modulated 1308
—, irreproducible 2559
— mechanism 1(review), 21, 31, 1501, 1586, 2567, 2594, 2598, 2607, 3626, 3954
— model 126, 127, 3114
see also Computerization; Models in chromatography
— parameter 1336
— prediction 18, 41, 126, 1327, 1332, 2532, 2614, 3062, 3944
—, review 1, 42
— time shift 2568
— variability 3469
- Reversed phases characterization see Sorbents new types (incl. bonded phases)
- Review(s), adsorption equilibrium 2602
—, affinity chromatography (and books) 144-146, 1458, 1460, 1468, 1470, 1471, 1473, 1474, 1479, 1481, 1482, 1484, 1579, 1914, 2717, 4065, 4066, 4178, 4378
—, application of high performance chromatography to various fields of science of technology 7, 9, 11, 229, 242, 323, 442, 687, 907, 912, 1206, 1224, 1240-1242, 1248, 1254, 1275, 1299, 1300, 1302, 1321, 1523, 1551, 1639, 1640, 1647, 1651, 1817, 1856, 1876, 1895, 1914, 2102, 2118, 2179, 2252, 2272, 2460, 2496, 2546, 2550, 2554, 2783, 2819, 2914, 2934, 2953, 2992, 3009, 3022, 3080, 3423, 3491, 3518-3520, 3533, 3631, 3806, 3809, 3832, 3849, 3916, 3919, 4002, 4030, 4115, 4119, 4165, 4196, 4202, 4266, 4268, 4291, 4293, 4320, 4332, 4334, 4361, 4378, 4389, 4398, 4441, 4615, 4656, 4664, 4701, 4705, 4714, 4722, 4856, 4890, 4895, 4896
see also review articles within individual entries of this section and reviews in the List of Types of Compounds Chromatographed
- Review(s), automated procedures 4036
—, borate ligands for affinity chromatography 1458
—, calibration, general 3933
—, chiral HPLC see Enantiomers (and diastereomers) separation, review
—, — derivatization 126, 1051
—, — mobile phases 4074
—, — sorbents and stationary phases 159, 426, 1491, 1507, 2737, 2742, 4003, 4088
see also Enantiomers (and diastereomers), separation, review
—, centrifugal partition chromatography 2755, 2756, 3764
—, clean up 1238, 3081, 4664
—, columns 1380, 1392, 1440, 2676
—, — coupled 4846
—, — switching 2272
—, — microbore and capillary 2992, 3911
—, comparison with capillary electrophoresis 4334
—, — — other chromatographic methods 3832
—, computerization 1436, 2695, 4041
—, countercurrent chromatography 2551, 2754, 4103
—, cyclodextrin in stationary phases 1507
see also Enantiomers (and diastereomers), separation, review
—, data system 1436
—, derivatization 2, 228, 348, 426, 472, 687, 881, 981, 1051, 1222
see also Enantiomers (and diastereomers), separation, reviews; Post column derivatization; Precolumn derivatization
—, detection (and detectors), general 1369, 2630, 3822, 3968-3971
see also review articles under individual entries of Detection (and detectors)
—, —, chemiluminescence 75, 881(review), 1368, 3971
—, —, circular dichroism 60
—, —, electrochemical 442, 881
—, —, fluorescence 881, 3980
—, —, indirect 3969
—, —, laser based 3980
—, —, photometric 3822, 3969
—, enantiomers separation 157, 1051, 1491, 1492, 1507, 2734, 2737, 2742, 2744, 3549, 3623, 3634, 3675, 4070, 4071, 4074, 4077, 4088, 4091, 4709, 4720, 4721
—, filters, silica-gel 3994
—, gel permeation chromatography 6, 8, 361, 1375, 2578, 3129, 3820, 3914, 3921, 3960, 4151, 4377
—, general 3939
—, high-speed chromatography 1294, 4332
—, histidine ligand affinity chromatography 1481
—, history of chromatography 2556
—, hydrophilic interaction chromatography 4150
—, hydrophobic interaction chromatography 1316, 1914, 4196
—, immobilized chelating agents 3908
—, — metal affinity chromatography 1468
—, — protein (peptide) stationary phase 1460, 1491
—, immunoaffinity chromatography 146, 2709
see also reviews under Affinity chromatography
—, instrumentation 3917
—, ion and ion-pair chromatography 5, 102, 1224, 1292, 1298, 2525, 2549, 3882, 3913, 3920, 4721, 4968
—, — exchange chromatography 2469, 4215
—, — exchangers 2662
—, layer-system liquid chromatography 4104
—, LC combined with GC 203

- Review(s), LC coupling, general 135
- , LC/AAS coupling 4064
 - , LC/AES coupling 4064
 - , LC/GC coupling 2936, 4057
 - , LC/immunoassays coupling 3972
 - , LC/MS coupling 137, 1241, 1295, 1446, 1447, 1449, 1452, 1456, 2461, 2707, 4053, 4055, 4058, 4059, 4062, 4064, 4385, 4863
 - , LC/NMR coupling 4050
 - , lectin, immobilized 4178
 - , liquid-liquid extraction 3081
 - , membrane 4101
 - , — affinity chromatography 4102
 - , — chromatography 4102, 4388
 - , — convective LC 97
 - , microbore (narrow-bore) chromatography 1304
 - , microcolumn 1647, 2547
 - , mobile phase 2552
 - models in chromatography 2695
 - , optimization 4, 1051, 2548, 3123
 - , peak overlapping 1325
 - , — purity 3970
 - , — size 3933
 - , postcolumn derivatization 228, 687, 981, 4291
 - , — reaction detection 1366
 - , precolumn derivatization 2, 348, 426, 429, 472, 687, 981, 1051, 2953
 - , preparative chromatography 1425, 3909, 3912, 3914, 3917, 3918, 4030, 4033
 - , quantitation 2548
 - , receptor-affinity chromatography 1471
 - , resolution 2553
 - , retention 2553
 - , — mechanisms 1, 42
 - , sample preconcentration 4069
 - , — preparation 1238, 3081, 4656
 - , selectivity 2553
 - , size exclusion chromatography see Review(s), gel permeation chromatography
 - , — — —, inverse 4011
 - , slalom chromatography 2102
 - , solid-phase derivatization 2, 426, 122, 3081, 3907, 4057
 - , solvent extraction 10
 - , stationary phases (and sorbents) 93, 1301, 1346, 1382, 1407, 1458, 1470, 1482, 1492, 3915, 3983, 3991, 4002
 - , — —, characterization 2655, 2656
 - , structure-retention relationship 42
 - , suppressed ion chromatography 4727
 - , theory of chromatography 1325, 2548, 2555, 2737, 3909
 - , trends, recent 1296
 - , validation 1322, 2270, 4705
- tRNA-agarose 572, 3297
- RNaseA-agarose 665
- Robotics see Automated procedures; Computerization
- Rotation locular countercurrent chromatography see Countercurrent chromatography
- Sample clean up see Clean up procedures
- enrichment 28, 2797, 3825, 4145
 - extraction, microwave assisted 1136
 - injection and injectors 46, 47, 985, 1355, 1357, 2119, 2563, 2721
 - matrix effects 3780
- Sample multiplexing 2590
- preconcentration 1450, 2792, 3000, 4069(review), 4288
 - preparation 1238(review), 1450, 2210, 2230, 2722, 3081(review), 4404, 4565, 4656(review), 4728
 - see also Solid phase extraction; Clean up
 - —, automated 1066, 1083, 1114, 1721, 1745, 2336, 2797, 4037
 - see also Automated procedures
 - pretreatment 28, 1450, 2343, 4681, 4783, 4998
- Selection of methods see Method development
- Selectivity 1393, 2553(review), 2808, 3937
- , physicochemical description 13
- Semipreparative chromatography see Preparative (and semipreparative) chromatography
- Separation time, minimum 2606
- Shock layers in LC 4029
- Silver resin chromatography see Stationary phases, impregnated with silver nitrate; Stationary phases, silver resin
- Simulated operations 121, 324, 325, 1433, 1442, 4039, 4044, 4046, 4086, 4140, 4724
- see also Computerization; Moving bed, simulated
- Size-exclusion chromatography see Gel permeation chromatography
- — — IEC mixed mode chromatography 1854
 - — —, inverse 4011(review), 4708
- Slalom chromatography 2102(review)
- Small bore columns see Columns, microbore and capillary
- Software see Computerization
- Solid/liquid extraction 2443
- Solid phase derivatization 2(review), 426(review), 1222(review)
- — extraction 10(review), 153, 155, 418, 433, 975, 986, 1061, 1066, 1067, 1074, 1104, 1122, 1175, 1195, 1381, 1488, 1489, 1514, 1524, 1529, 1540, 1552, 1563, 1675, 1676, 1710, 1718, 1726, 1805, 2140, 2189, 2213, 2215, 2221, 2233, 2320, 2331, 2334, 2339, 2348, 2351, 2356, 2362, 2378, 2382, 2384, 2389, 2392, 2414, 2427, 2438, 2467, 2540, 2722, 2787, 2794, 2807, 2818, 2978, 3081(review), 3454, 3594, 3537, 3574, 3578, 3579, 3587, 3591, 3649, 3686, 3692, 3740, 3745, 3748, 3769, 3790, 3861, 3907(review), 4057(review), 4123, 4267, 4286, 4351, 4627, 4657, 4666, 4671, 4712, 4734, 4742, 4747, 4754, 4766, 4770, 4781, 4793, 4813, 4815, 4820, 4830, 4839, 4859, 4872, 4878
 - — —, comparison of materials for liquid-liquid extraction 4657, 4872
 - — —, device 2622
 - — —, optimization 155
 - — —, sorbents 101, 1381, 1488, 1489, 1514, 1748, 4012, 4657, 4872
 - see also Clean up
- Solvation energy 1338, 2595, 3937
- Solvent(s) see Mobile phase
- extraction chromatography 1520
 - peak 3923
 - selection 24
 - strength 23, 1332
- Solvent-stationary phase interaction 3940
- Sorption see Adsorption
- Speed, limits 2592
- Spun column chromatography, improved 3225
- Standard selection see various types of chromatography

- Stationary phase(s), acrylamide 1026
- — , acrylonitrile 1026
 - — , agarose based 1400, 3117
 - see also various types of agarose based sorbents
 - — , alkylamide 79
 - — , alumina based 874, 1663, 2648, 2672, 3470, 3745, 3829
 - — , aminated poly(γ -methyl L-glutamate) spheres 3144
 - — , amylopectin-silica 4073
 - — , avidin bonded 328, 2741, 3248
 - — , bonded phases see various kinds of bonded phases and Stationary phase(s), new types
 - — , butylphenyl bonded phases 2673
 - — , calcium hydroxide 4619
 - — , camphorsulfonic acid, dynamically modified silica gel 2575
 - — , carbohydrate carbamate coated 4082
 - — , carbon 515, 1308, 1382(review), 1729, 2784, 2830, 3033, 3989, 4002(review), 4655, 4702
 - — , cellulose acetate 1346(review)
 - — , — based see Cellulose based sorbents
 - — , cerium(IV) oxide 4105
 - — , cetyltrimethylammonium coated 3888
 - — , characterization 78, 1435, 1467, 2638, 2653, 2655(review), 2656(review), 2666, 2670, 2674, 2681, 4021
 - — , chelexes 2665
 - — , chiral see Chiral sorbents and stationary phases
 - — , chitosan beads 2667
 - — , comparison 80, 90, 92, 115, 1393, 1792, 1853, 2234, 2473, 2699, 2808, 3120, 4107, 4275, 4682, 4887, 4936
 - — , composite 1402
 - — , continuous gel 3124
 - — , — rod 4016
 - — , copper(II) bonded complexes 1337
 - — , crown ether 1276, 1767, 2608, 3867
 - — , cyano see CN-bonded phases
 - — , cyclodextrins see Cyclodextrin, stationary phase
 - — , degradation 1406
 - — , disinfection 87
 - — , diol-modified silica 1399, 1401
 - — , dynamically coated 4947
 - — , effect of bed compression 1383
 - — , electric potential 1416
 - — , electrochemically modulated 3996
 - — , ethoxyethylacrylate 1412
 - — , fluorinated 85
 - — , fluorocarbon bonded 4085
 - — , fluorocarbon bonded 2681
 - — , for affinity chromatography 143, 149, 150, 517, 554, 1374, 1409, 1458(review), 1459, 1460(review), 1464-1467, 1469, 1470(review), 1472, 1475-1478, 1480, 1482(review), 1485, 1848, 1866, 1989, 2645, 2647, 2667, 2682, 2716, 2719, 3029, 3153, 3158, 3168, 3234, 3248, 3257, 3266, 3385, 3851, 3991(review), 3993, 4014, 4382, 4419, 4501, 4505, 4551
 - see also various kinds of stationary phases(s)
 - — — gel permeation chromatography see Gel permeation chromatography
 - — — ion-exchange chromatography see Ion exchangers, new types
 - — — micellar chromatography see Micellar chromatography, stationary phase(s)
- Stationary phase(s), for preparative chromatography 105, 1385, 1386, 1405, 2660, 2664, 2981, 4016, 4390
- — , fullerene bonded 103
 - — , glass, pore 589, 1262, 1588, 4018
 - — , — , glutaraldehyde-activated 4018
 - — , glucuronic acid bonded 3999
 - — , glycol methacrylate 4937
 - — , humic acid bonded silica 1247
 - — , hydroxyapatite see Hydroxyapatite
 - — , hydroxyethyl methacrylate based 1020
 - — , immobilized see various kinds of immobilized substances
 - — , — polymethyloctadecylsiloxane 2657
 - — , impregnated with silver ion 1602, 1620, 1661, 2910, 2927, 2928, 2948
 - see also Stationary phases, silver resin
 - — , interactivous 4692
 - — , life 1407(review)
 - — , liquid crystal bonded 4112
 - — , macrocycle 4949
 - — , magnesia coated 4007
 - — , magnetically stabilized 100
 - — , metaphosphates 84
 - — , microporous resin 2650
 - — , mixed bed 1016, 2792, 4020, 4920, 4945, 4983
 - — , molecularly imprinted 1750, 4009
 - — , new types 86, 197, 1388, 1390, 1397, 1414, 1420, 1511, 2664, 3193, 3873, 3877, 4710
 - see also various kinds of stationary phases(s)
 - — , nitrile bonded 977
 - — , nonporous 551, 554, 898, 1892
 - — , oligo(ethylene glycol) dimethacrylate beads 2670
 - — , ovomucoid 2303, 4076
 - — , packing 1415
 - — , particle size 4010
 - — , pellicular 4013
 - — , pentafluorophenyl bonded 913
 - — , pepsin bonded 4075
 - — , perfluorinated bonded phases 2673
 - — , permeable 1404, 2688
 - — , polyacrylate 4323
 - — , polyamine bonded 3614
 - — , polyamine-polyurea, carboxymethylated 2497
 - — , polyaniline 184
 - — , poly(butadiene-maleic acid) 3997, 3998
 - — , poly(dibenzo-18-crown-6) 3867
 - — , polyethylenimine coated 2534
 - — , poly(glycidyl methacrylate-co-ethylate dimethacrylate) 4016
 - — , polymer, molecularly imprinted 4009
 - — , polymeric 610, 848, 929, 930, 1383, 1410, 1492(review), 1567, 1872, 2440, 2665, 2670, 2680, 3915(review), 3990, 3991(review), 4247, 4682
 - — , polymethacrylate 2569
 - — , polypropylene 2440
 - — , polysiloxanes 4008, 4089
 - — , polystyrene 76, 1872, 4382
 - — , — , alcohol coated 1872
 - — , polystyrene-divinylbenzene 373, 866, 895, 929, 930, 1026, 1136, 1638, 1712, 2099, 2104, 2194, 2202, 2203, 2259, 3562, 4648
 - — , polyurethanes 1395

- Stationary phase(s), poly(vinyl alcohol), esters 3320
 — —, poly(vinylimidazole) coated 1875
 — —, pore size 91, 3120
 — —, — structure 4001
 — —, preparation 2263, 2653, 2659, 2670, 2671, 2674, 2680, 3981, 3982, 4581
 — —, properties 2259, 2646, 2652, 3124, 3984
 — —, quality 1044, 1398
 — —, regeneration 4000
 — —, restricted access 2961, 4837
 — —, reviews 93, 1301, 1346, 1382, 1407, 1458, 1470, 1482, 1492, 3915, 3983, 3991, 4002
 — —, sand 1033
 — —, short-fiber 3987
 — —, sialic acid, coated 1796
 — —, silica-based 80, 81, 197, 551, 554, 1397, 1399, 1505, 2575, 3873, 3875, 3877, 3983(review), 3985, 3992, 3995, 4082
 — —, silver resin 1654
 see also Stationary phases, impregnated with silver nitrate
 — —, sodium dodecyl sulfate 2635
 — —, stability 79, 81, 1393, 3986
 — —, styrene-divinylbenzene 1652, 2671
 — —, sulphonamide bonded coatings 2644
 — —, surface composition 94
 — —, — structure 854
 — —, temperature-controlled selectivity 3990
 — —, thoria 2672
 — —, titania 2672
 — —, tri-N-octylphosphine oxide supported 2440
 — —, triphenyl bonded 197
 — —, unsaturated bonded phases 2674
 — —, zeolite 3866
 — —, zirconia 93(review), 1418-1420, 2534, 2672, 4001
 — —, zirconium gel 4229
 — —, zwitterionic exchanged 4006
 Statistical treatment of data 1312, 2579
 Steric exclusion liquid chromatography *see* Gel permeation chromatography
 Structure-retention relationships 39, 41, 42(review), 392, 415, 977, 1107, 1339, 1340, 1559, 1586, 1759, 1794, 1795, 2090, 2274, 2610-2614, 3493, 3954, 3955, 3958, 4777
 Support(s) organic *see* Stationary phase(s)
 Suppressed ion chromatography 4727(review)
 System peak 29, 212, 1318, 2587, 2735, 3934, 3935
 — suitability 2576
 Temperature effects 31, 193, 197, 447, 1020, 1317, 1328, 1408, 1503, 1758, 1825, 2212, 2365, 2433, 2725, 2768, 2920, 3766, 3937, 3990, 4040, 4154, 4161, 4262, 4711
 —, high 1036, 3604, 3620, 4092
 —, low 4224
 — programming 4035
 — rising elution fractionation 1023
 Theory of chromatography 12, 16, 26, 35-38, 188, 1324, 1329, 1330, 1334-1336, 1879, 2568, 2603, 2735, 2762, 3495, 3927, 3940, 3941, 3943, 3945-3953, 4097, 4399
 — — —, reviews 1325, 2548, 2555, 2737, 3909
 Thermodynamics of chromatography 26, 1337, 1499, 1525, 1883, 2593-2596, 2608, 2761
 Thermostat 53, 2621
 Thiophilic adsorption chromatography 1898
 — membrane 1919
 Thiopropyl-agarose 815, 3291, 4480
 Torroidal coil centrifugal partition chromatography *see* Centrifugal partition chromatography; Partition chromatography
 Trace enrichment *see* Sample enrichment; Sample preconcentration; Sample pretreatment
 Trends, recent 1296(review)
 Triazine dye affinity chromatography *see* Dyes as ligands in affinity chromatography
 Trypsin-agarose 4195, 4470
 Tubulin-agarose 4466
 Two-dimensional chromatography *see* Multidimensional chromatography
 UDP-glucuronosyl-agarose 722
 Validation 108, 1040, 1165, 1314, 1322(review), 2092, 2270(review), 2531, 2573, 2597, 3847, 3872, 4000, 4023, 4038, 4047, 4048, 4307, 4400, 4582, 4705, 4711, 4747, 4767, 4781, 4866
 WGA-agarose 4195
 Zn-agarose 3157