Index

Page numbers in *italics* refer to Figures, while those in **bold** denote Tables.

accumulation rates 2–3, 341–2
acicular gypsum 201, 203
Africa see North Africa; South Africa; West African margin
age data 24, 28, 31–2
alabaster facies 133–4, 227
Algeria, Berkine/Ghadames Basin 87–105
allochthonous gypsum 117–18, 200, 207, 209
analogues see modern analogues
Angola margin 26
anhydrite
   Bilche–Volytsya zone, Ukraine 322
   breccia 317
   Carpathian Foredeep Basin 108, 109
   Dhiban Formation 59, 60, 61, 62
   Great Kavir Basin 76, 78
   isotopic composition **257**
   nodules 175, 176
   Permian Basin 337, 340
   Poland 277
   pseudomorphs 346, 347
   rehydration 203–5
   Ukraine 267, 269, 270, 317, 320
   Zbudza Formation 254, **257**
anhydrite–carbonate couplets 8
anhydrite–carbonate–halite triplets 8
anhydrite–halite laminates 359–60
anoxia 236–7
anoxic monimolimnion 236–7
antiform structures, calcite 293, 300, 302
Anzano Molasse 194–5, 196
Apennines see Southern Apennines
Aptian salt basin 24–8, 31
aragonite 147
Aral Sea 236
Argilles Vertes Formation 20, 24
Artemivs’k rock salt deposit, Ukraine 314
authigenic mineralization 313
autochthonous gypsum 117–18, 200, 207–8, 209
autoclastic breccias, calcite 291
Badenian evaporite (meromict) basins
   Carpathian Foredeep 4, 219–46
   brine transport 238–40
   evaporites distribution 220, 221
   halite crystallization 221, 240
   hydrographical model 230–1
   mixolimnion 231, 235–6
   modern analogues **232–4, 236**
   monimolimnion 236–7
   subbasins 221
   East Slovakian Basin 247–64
   Ukraine 268, 319
Badenian gypsum facies 4, 107–42, 116
clastic gypsum (allochthonous) 117–18
corine-crystalline selenite 118–24
glass-like selenite 124–7
lithosomes 117–18
microbialite 117–18
stratigraphy **119, 240–1**
see also salina-type evaporite basin
banded halite facies 171, 173
Barremian sediments 31
base-level oscillations 210, 211
basement morphology, South Atlantic 25–8
basins
   Badenian evaporite basin 219–46
   Berkine/Ghadames Basin 87–105
   East Slovakian Basin 247–64
   Great Kavir Basin, Iran 69–85
   Kirkuk Basin, Iraq 53–68
   Permian Basin, USA 335–64
   pre-salt sag basins 15–35
   salina-type 107–42
bassanite 322
Berkine/Ghadames Basin 87–105
evaporite cycles 93–6
lithostratigraphy 90, 91
palaeogeography/evolution 98–9, 100–1
seismic stratigraphy 91–3, 94–5
sequence stratigraphy 96–8
Bilche–Volytsya zone, Ukraine 320–3
bloedite 150, 152
bottom dissolution fabrics 347–50
bottom-growth deposits
   calcite–anhydrite 358
   fabrics 344–7, 348–9
   gypsum 200, 225, 237
   selenite 112–15
Brazilian continental margin 17
pre-salt sag basin deposits 19–20
seismic reflection profiles 21–3
topography 28–31
breccias
   anhydrite 317
   autoclastic 291
   calcite 291, 302
   carbonate 155–68, 198–9
   collapse 302
   from dissolution 159, 160, 166
   halite facies 172, 175
   microbreccias 161
   Monte Castello evaporites 209
brine flows
   downslope transport 238–9
   halite zone 228–30
   Halych, Ukraine 227–8
   meromict basins 239–40

Downloaded from https://pubs.geoscienceworld.org/books/chapter-pdf/3890961/9781862395336_backmatter.pdf by guest
brine flows (Continued)
mixolimnion 231
orientation 219–20
swirl pattern 228
brine inclusions see fluid inclusions
brine sheets, majanna-type shoals III, 115–17
brines
density stratification 343–4, 360
Great Kavir Basin 81–3
transport concepts 238–40
Ukraine 270, 329
bromine
fluid inclusions 280, 282
in halite 81, 81, 358–9
rock salt 255, 257, 268, 317, 329
Burdigalian stage
basin configuration 55–64
Kirkuk Basin 53–68
marine transgression 66
CaCl2 hydrothermal brines 80, 81–3
Calabria, Italy, Messinian halite facies 169–78
calcite
herringbone structure 289, 294, 296–301, 303–5
mosaics, Neoarchaean 296–301
nodules 288, 292, 296
pseudomorphs 287
see also carbonates
calcite–anhydrite cumulative couplets 346, 358, 359
calcite–anhydrite–halite triplets 358
calcium sulphate see anhydrite; gypsum; selenite
Campbellrand Subgroup, South Africa 289
Campos basin, Brazil 20, 28–31
cap rocks, residual halite facies 174, 175, 176
carbon isotopes, carbonates 183, 188
carbonate–anhydrite cycles 96
carbonates
‘B marker’, Berkine/Ghadames Basin 93–6
Bilche–Volysya zone, Ukraine 320
breccias 155–68, 198–9
conglomerates 155–68
former evaporite features 285–308
Great Kavir Basin 78
Kirkuk Basin 53–68
oxygen and carbon isotopes 182–3, 188
see also calcite; dolomite; limestones
carnallite 76–7, 267, 268, 323, 324
Carpathian Foredeep Basin
Badenian gypsum facies 4, 107–42
Badenian meromict basin 219–46
evaporites distribution 116, 220, 221
selenite facies 4, 118–37
Ukraine 265–73, 318–23
Castile Formation, USA 358–9
cauliflower (cavoli) structures 292, 301
Central Ebro Basin, Spain 143–54
chamberite 324–5
channel structures 133–5
channel-mouth lobe deposits 37–52
Chela unconformity 22, 28
chevromine 230, 231
see also pyromine
chevron structures, halite 78, 253, 254, 257, 275, 278–80
chicken-wire structures 295
chlorides
Bilche–Volysya zone, Ukraine 322–3
brines, Ukraine 270
Great Kavir Basin 74–8
Zbudza Formation 248, 249–54
clastic evaporites 169, 347
gypsum 136, 205, 206
halite 249–54
clastic lobe deposits 37–52
depositional environment 46–50
ellipsoidal mounds 39–41, 43, 46
ribbon-shaped bodies 41–3, 46, 48
clay laminae 322
clear halite facies 171–2, 173–4
crystalline gypsum 322, 328
crystalline-selenite selenite 114, 118–24
collapse breccias 302
columnar structures 302–3
conceptual models, salina-type basin 107–11
constructional clastic depositional body 43–6
continental extension, South Atlantic 20–3, 25–7
continental red bed facies 70–3
Coriols effect 238
Crimea 319–28, 326
Crotone basin, Calabria 169–78
halite facies 171–4
residual facies 174–6
crustal thinning, South Atlantic margins 20–3, 25–7
crystallization see individual minerals
cumulate deposition 344, 345, 346, 358–60
cyclicity
Berkine/Ghadames Basin 93–6
Castile Formation, USA 358–9
Messinian evaporites 181
Permian Basin 339
selenites 212
Zbudza Formation 254–6, 261
Zechstein evaporites 277
d’ansite 76, 77, 78
Daunia tectonic unit 196
debris flows 20
dedolomitization 165
deep-brine pans
coarse-crystalline selenite 118–24
depositional model 123
dep deep burial alteration 6
dep deep water
facies 7, 8, 31, 93
fabric criteria 342–4, 356
see also monimolimnion
deformation
calcite 302, 304–5
halite 173, 177
Delaware Basin, USA 336
Delaware Mountain Group, USA 357–8
density stratification in brines 343–4, 360
deposition
deep water 34–5
models 80–1, 82, 123, 260
rates 2–3
shallow water 344–50
styles 5–6
see also redeposition
depth indicators 335–64, 356
accumulation rates 341–2
fabric criteria 342–56
methods of determination 337–41
detrital pseudocarniole 161–3, 166
Devonian evaporites, Ukraine 312–15, 328
Dhiban Formation, Iraq 59–64
diachronous basin development 18–19, 24, 31
diagenetic features, Neoarchaean carbonates 287, 288, 301–4, 305
diapirs
Crotone basin 170, 171, 174, 177
Dnipro–Donets depression 311–12, 313, 314
Iran 69, 71
Transcarpathian trough 326
see also salt domes
diatomite–carbonate–gypsum sequence 211
directional structures 224, 225–8
dissolution
bottom fabrics 347–50
carbonate breccias 159, 160, 166
dolomite 165
gypsum/anhydrite 164–5
halite 177
pipes 351, 352
pits 351–2, 352–3, 356
residual pseudocarniole 159–61, 166
dissolution surfaces
bottom growth 349–50
coarse-crystalline selenite 118–24, 119, 122
microbial mats 122–3, 124
distal sector evaporites 211
Djeno Formation 19, 20
Dnipro–Donets depression, Ukraine 310–15
Devonian evaporites 312–15
Permian evaporites 313–15
dolomite 60, 62, 165
see also carbonates
dolomitization 287, 290, 301
downslope deposition 344
downslope transport 238–9
drawdown
Aptian salt basin 27–8
Badenian evaporite basin 108, 109
Late Messinian 211
see also water-level fluctuations
East European platform 316, 319
East Slovakian Basin
geology 247–8
salt facies deposition model 260
Zbudza Formation 247–64
economic deposits see industrial deposits
El Arish–Afiq Canyon 40, 42, 43, 44, 48–9, 48, 49
ellipsoidal mounds, clastic lobe deposits 39–41, 43
evemission events, shallow-brine pans 130–3encrusting pseudocarnirole 163, 164, 166
enterolithic structures 295–9
Eocene
continental red bed facies 70–3
marine regression, Iran 70
ephemeral (seasonally drying) lakes 131–3
epsomite 147–8, 152, 268
Erva Formation 20
Euphrates Formation, Iraq 55–9
euxinic monimolimnion 237
evaporation rates 3
Evaporiti di Monte Castello Formation 191–218
depositional setting 209–12, 210
diatomic and euxinic facies 198
 evaporitic limestones 197, 198–9
geochemical setting 194–5
gypsum lithofacies 200–5, 211
stratigraphic relations 207–9
strontium geochemistry 205–7
pre-evaporitic lithofacies 198
regional tectonic model 212, 213
stratigraphy 196–200
seismic stratigraphic setting 213–14
experimental evaporation 143–54
exposure depth indicators 350–6
above water table 351–2, 356
below water table 350–2
surface deposition 355–6
extensional faulting 26
Ezanga evaporites 20–5
fabric criteria depth indicators 342–56
above and below water table 350–6
deep water 342–4, 356
distribution 357
shallow water 344–50, 356
facies
Kirkuk Basin 56–9
‘pseudocarniole’ 158–63, 166
tectonically active/passive basins 6–9, 8
see also gypsum facies; residual facies; selenite facies
Faeto Flysch 194, 196
Famennian evaporites, Ukraine 313
faunal assemblages, Kirkuk Basin 57
filamentous laminates 287–90
crystalline halites 253, 254
gypsum microbialite 118
flamboyant calcite 298, 301, 303
floral assemblages, Kirkuk Basin 57
flows
debris flows 20
halite 173, 177
mud flow 261–2
see also brine flows
fluid inclusions
halite 79–80, 277–9
sylvite 79–80, 275–84
Ukraine evaporites 309, 315
fold-and-thrust belt 194
folded flysch 318
foraminifera 57, 58–9, 65
Forecarpathian region, Ukraine 317, 323–5
Foredobrogean trough, Ukraine 317–18
Frasnian evaporites, Ukraine 312–13
Gabon–Angola continental margin 16
geochemistry
depth indicator 342
Great Kavir Basin 78–9
geochemistry (Continued)
isolates 187, 188, 205–7
modelling, natural brines 143–4
PHRQPITZ code program 144, 147
Zbudza Formation 256–7, 262

geology
Badenian evaporite basin 220–5
Carpathian Foredeep Basin 266–8
Crotone basin 169–70
East Slovakian Basin 247–8
Great Kavir Basin 69–74
Monte Castello evaporites 194–5
Romagna Apennines 180–1
graben structures 70, 248, 310–11
glass-like selenite facies 124–7
long-distance correlation 127, 128
sediimentary features 126
gravity deposits 20, 344
Great Kavir Basin, Iran 69–85
brine origin and evolution 81–3
carbonate unit 78
chloride unit 74–8
depositional model 80–1, 82
geochemistry 78–9
geology and stratigraphy 69–74
siliclastics 73, 78
sulphate beds 78
Great Salt Lake, Utah 236
gypsumarenites 205, 206
gypsities 205
gypsrudites 205, 206
gypsum
Bilche–Volytsya zone, Ukraine 322
cement 176–7
clastic 126
Dhiban Formation 59
Ebro Basin brines 147–8, 294, 296–301, 248–311
enterolithic folds 295–9
Great Kavir Basin 76, 78
Kerch peninsula 327–8
monimolimnion 345
Monte Castello 199–200, 201, 203
nodules 175, 176, 203–5, 296
replacement 305
sulphur isotopes 183
turbidites 10
Ukraine 270, 317, 320
gypsum facies
Carpathian Foredeep Basin 4, 107–42, 109, 220
Monte Castello evaporites 200–5, 207–9
see also Badenian gypsum facies
gypsum-anhydrite deposits 320–3

halite
Badenian basin 221, 239–40
Bilche–Volytsya zone, Ukraine 322
bottom-growth 347, 349
brine flows 228–30
bromine content 78–9, 81
Carpathian Foredeep Basin 108, 109
clastic 249–54
cumulate deposition 345
deformation and flow 173, 177
Dhiban Formation 59, 60, 62
diapers 170, 171, 174, 177
dissolution 177
facies, Crotone basin 171–4
fluid inclusions 79–80
Great Kavir Basin 72, 73, 75, 76–8
La Playa brines 147–8, 152
majanna flats 115
non-deposition 61
Permian Basin 337
Poland 277
primary 78–9, 268, 322
redeposition 249–54, 258–61
sedimentary structures 277–9, 278, 280
Ukraine 267
see also rock salt
halite arenites 253, 254
halite rudites 253, 254
Halych, Ukraine, palaeocurrent analysis 223–8
herringbone calcite 287, 294, 296–301, 303–5
hexahedrite 268
high-amplitude bodies 39–41, 43–8
hinge zone, South Atlantic margin J9, 20, 21
holomictic pans 112–13
horst-and-graben structures 70, 248
see also grabens
horsts 311
hydrographical model, meromictic basin 219, 230–1
hydrothermal fluids 'pseudocarniole' origin 156, 163, 164–5, 166
Ukraine salt domes 309, 313
industrial deposits
potash 265, 323–4
rock salt 249, 261
ionic strength of brines 147, 148, 150
Iran, Great Kavir Basin 69–85
Iraq, Kirkuk Basin 53–68
Irpinia–Daunia Mountains, Italy 191–218, 195
isochronous deposition 127–30
isopach analysis 55–6, 59–64, 65
isolopes carbon 183, 188
fractionation 272
geochemistry 187, 188
oxygen 183, 188
stratigraphy 179–90
strontium 181, 182–3, 207, 272
sulphur 183, 265–73
Italy
Crotone basin, Calabria 169–78
Monte Castello evaporites 191–218
Vena del Gesso evaporites 179–90
Jeribe Formation, Iraq 65, 66–7
Jurassic evaporites
Berkine/Ghadames Basin 87–105
Ukraine 316–18, 328–9
kainite rocks 266, 267, 268, 323–4
kainite–langbeinite rocks 266, 323–4
Kalush–Holyn potash deposit, Ukraine 265–72, 319, 320, 323–4
karst features 199
infill 161–3, 165
post-depositional 351–2
synsedimentary 351–2, 352–3
Kenya, Lake Magadi evaporites 128
Kerch peninsula (Crimea) 326, 327–8
kieserite 266, 267, 324
Kirkuk Basin, Iraq 53–68
Burdigalian configuration 55–64
Langhian configuration 64–5
La Playa/La Salina saline systems, Spain 143–53, 144
brines 147–8
chemical data 145, 146
mineral precipitation sequence 148
saturation indexes 147, 149–50, 151
laminar deposits 6–7
laminated gypsum
Badenian basin 220–1, 237, 240
channel structures 134–5
Monte Castello evaporites 201–3, 204
laminites, calcite 287–90
langbeinite 76, 77, 78, 266, 267, 324
langbeinite–kainite rocks 266
Langhian stage 53–68
Levant continental margin 37–52
limestones 59, 61, 64, 197, 198–9
see also carbonates
lithology and environment 9–11
lithospheric mantle thinning 29
lithostratigraphy 90, 91, 223–5
Loeme evaporites 20–5
lowstand deposits 270–2
Lukunga Sandstone Formation 19–20
magnesium sulphates 80, 81–3, 265–73
magni-type shoals 111, 135–7
depositional environment 115–17
gypsum microbialites 133–5
Malmani Subgroup, South Africa 286
Mansuriya oilfield, Iraq 63
mantle thinning 29, 30
marine deposits
Kirkuk Basin 58, 68
Miocene evaporites 325, 328
Pernian Basin 337
Zechstein salts 281–3
marine recharges 188
marine regression 70
marine transgressions 66, 99–101
Marnes Noires Formation 20, 23–4
mass mineral precipitation 153
Mediterranean region
Levant margin 37–52
Lower Evaporites 192, 193
Messinian sedimentary cycles 192
Messinian Salinity Crisis 191–2
regional stages 327
Upper Evaporites 192
Melheh salt pit, Iran 72, 73, 75, 79, 80
meromictic basins
Badenian evaporite basin 219–46
brine accumulation 239–40
classification 111–12
hydrographical model 230–1
mixolimnion 231–6
monimolimnion 236–7
Messinian
clastic lobe deposits 37–52
Crotone basin, Calabria 169–78
evaporites pinch-out 38, 39, 40
Monte Castello evaporites 191–218
reworked evaporites 10
tectonic activity 192, 193
Vena del Gesso evaporites 179–90
Messinian Salinity Crisis (MSC) 37, 48–9, 169, 191–2, 212
micro-breccias 161
microbial mats 130, 133
calcite 287–90, 300
gypsum dissolution surfaces 122–3, 124
microbialites 304–5
architecture 135–7
Badenian 118
shallow-brine pans 125, 133–5
Middle Miocene see Badenian
Midland Basin, USA 336
mineral precipitation sequence 148, 150
mineralization
authigenic, Ukraine 313
hydrothermal 309, 313
rock salt residues, Ukraine 314
mineralogy
La Playa/La Salada brines 152
Ukraine evaporites 268–9
Miocene
geochronology and biostratigraphy 249
Kirkuk Basin 53–68
palaeogeography 108
stratigraphy 53–4, 320–1
see also Badenian...
Miocene evaporites
active tectonic setting 10
clastic deposits 37–52
East Slovakian Basin 247–64
Great Kavir Basin 69–85
Ukraine 265–73, 318–28, 329
Zbudza Formation 247–64
mirabilite 148, 150, 152
mixolimnion (mixed layer)
Badenian evaporite basin 231, 235–6
brine flows 231
meromictic basin model 230–1
modern analogues 231–5
stratification-mixing pattern 230, 231–6
models
depositional 80–1, 82, 123, 260
meromictic selenite basin 219–46
Pitzer’s model 143
salina-type evaporite basin 107–11
modern analogues
Badenian evaporite basin 232–4, 236
mixolimnion 231–5
shallow-brine pans 131–3
Moldova 119, 121, 223

INDEX

monimolimnion
- Badenian evaporite basin 236–7
- halite 240
- meromictic basin model 230–1
- selenite deposition 237
monogenetic breccias 159, 160, 163
monomictic pans 112–14
Monte Castello evaporites 191–218
MSC see Messinian Salinity Crisis
mud flow 261–2
mudstones 93, 355
Na–K–Mg–Cl–SO₄ brines 281, 282–3
needle-like gypsum 201, 203
Neoarchaean carbonates 285–308
- calcite mosaics 296–301
evolution 305
granular facies 292–6
laminites 287–90
sedimentary structures 295–9
Neogene 325–6
- see also Miocene
New Mexico, Permian evaporites 335–64
Nile Delta 49
nodular ‘fenestrate’ fabric 303–4
nodules
- anhydrite 175, 176
- calcite 288, 292, 296
gypsum 175, 176, 203–5, 296
non-deposition, halite 61
non-selenite deposition 130–3
North Africa, Berkine/Ghadames Basin 87–105
nucleation cones 301–2
oligotrophic pans 133
onlap, Messinian 50
ophiolitic mélanges zones 70, 71
organic matter 182, 186
orientation
- brine flows 219–20
- selenite deposits 224, 225–8
- oxygen isotopes 183, 188
palaeocurrent analysis
- Badenian basin 231
- Halych, Ukraine 223–8
- Zolota Lipa, Ukraine 229
palaeogeography
- Badenian evaporite basin 220–2
- Berkine/Ghadames Basin 98–9, 100–1
- East Slovakian Basin 248
- Kerch peninsula 326
- Mediterranean, Messinian 192
palaeokarst features 199
Palo Duro Basin, USA 336
Paraná basin, Brazil 28–31
Paratethys 247–8, 249, 227
Permian Basin, USA 335–64
- depositional history 335–7
- evaporite cycle types 339
- fabric criteria 342–56
- deep water deposition 342–4, 356
- exposure 350–6

shallow water deposition 344–50, 356
sediment accumulation rates 341–2
water depth determination 337–41
Permian evaporites
- depth indicators 335–64
- Dnipro–Donets depression 313–15, 328
- primary sylvite 275–84
PHRQPITZ geochemical code program 144, 147
pipes, dissolution 351, 352
pits, dissolution 351–2, 352–3, 356
Pitzer’s model 143
playa–lake systems 131–3
- experimental evaporation 143–54
- mass mineral precipitation 153
Poland
- Badenian evaporite basin 221, 223
- Badenian gypsum deposits 116, 119, 121, 126
- primary sylvite generation 275–84
polygenetic breccias 159, 161, 162
polyhalite
- Great Kavir Basin 76, 77, 78
- Ukraine 266, 267, 270, 324
polyhalite–anhydrite bed 269–70, 271
polymictic pans 112–14
Porto Seguro Formation 20
post-depositional karst features 351–2
post-rift deposition 15, 17, 18, 23, 25
potash salts
- Carpathian Foredeep 265–73, 309
- depositional model 80–1
- Forecarpathian region 323–5
- Frasnian, Ukraine 312
- Great Kavir Basin 72
- Miocene, Ukraine 319, 320
- Permian, Ukraine 314–15
Poland 277
precipitation 272
Ukraine 318
pre-salt sag basins 15–35
- Barremian to Aptian sediments 31
- basement morphology and structure 25–31
- Brazilian margin 17, 18, 19–20
- capping sequence 20–5
- depositional packages 19–20
- depositional space problem 18, 26–8, 31
- tectonic accommodation 18
- West African margin 16, 18, 19–20
precipitation sequence 148, 150
primary halite 78–9, 268, 322
primary sylvinite 76
primary sylvite 275–84
proximal sector evaporites 211
‘pseudocarniole’ 155–68
- chronology 165–6
- facies and sub-facies 158–63, 166
- genesis 163–5, 166, 167
- hydrothermal fluids 156, 164–5, 166
pseudomorphs
- anhydrite 346, 347
- selenite 292, 301
pycnocline 3–5, 228, 231
recrystallization, halite 173, 177
red algae 57, 58–9
INDEX

Red Formation, Iran 70–3
red siliciclastic mudstones 355
redeposition 347
  gypsum 205, 206, 207, 209
  halite 249–54, 258–61
regional tectonic control 212, 213
relative humidity (RH) 3, 24
replacement, gypsum 305
residual facies, Crotone basin 174–6
residual pseudocarniole 159–61, 166
reworked evaporites 5–6, 7, 10
see also redeposition
RH see relative humidity
rifting
  deformed evaporites 9, 10
  evaporite deposition 80–1
  Great Kavir Basin 69–85
  pre-salt sag basins 18–19, 31
  Saharan evaporite basin 101–3
  syn/post-rift deposition 15, 17–18, 23, 25, 32
rock salt
  Bilche–Volytsya zone, Ukraine 320–3
  geochemistry, Zbudza Formation 256
  mining 318
  Transcarpathian trough 326
  Ukraine 312–13, 314, 317
see also halite
Romagna Apennines 179–90
  rose diagrams, selenite orientation 226–7, 228
sabkha-type evaporites 96
Saharan evaporite basin 99–103
Saharan Platform, North Africa 87–105
Salado Formation, USA 359–60
salina-type evaporite basin 107–42
  deep-brine pans 120–4
  definition 108–9
  lithosomes 117–18
  main features 109–11
  majanna-type shoals 111, 115–17
  saline pans classification 111–15
  shallow-brine pans 124–37
  stratification-mixing cycles 112–14
  water-level fluctuations 110, 120–2, 123
see also Badenian gypsum facies
saline clays 319
saline pans
  hydrographical classification 111–15
  selenite deposition 112–15
  stratification-mixing cycles 112–14
salinity 3–5
see also pycnocline
salt domes see diapirs
Santos Basin, Brazil 20, 28–31
  depocentre thickening 24
  seismic reflection profiles 21–3
saturation indexes, La Playa/La Salada brines 147, 149–50, 151
saturation shelf concept 238
SCC see sedimentary chaotic complex
sea-level position 49–50
seafloor spreading, South Atlantic 18, 20–3, 25
seawater evolution 309–10
sediment accumulation rates 2–3, 341–2
sedimentary chaotic complex (SCC) 169
sedimentary structures
  calcite 285–308
  caulifower structures 292, 301
  enterolithic structures 255–9
  halite 277–9, 278, 280
  herringbone structure 289, 294, 296–301, 303–5
  selenite 124
  Zbudza Formation 252
dendrometry, Zbudza Formation 247–64
seismic control 7, 260–1
seismic data
  Berkine/Ghadames Basin 88–90
  clastic lobe deposits 38–42
  interpretation 42–6
  ribbon-shaped bodies 41–2, 43, 46, 48
  seismic geomorphology techniques 37–52
  seismic stratigraphy 91–3, 94–5
selenite
  crystal aggregates 294
  pseudomorphs 292, 301
selenite deposition
  cycles 212
  meromictic basin 219–46
  mixolimnion 237
  orientation 224, 225–8
  below pycnocline 114, 120–2, 123, 127, 129
  rose diagrams 226–7, 228
  saline pans 112–15
selenite facies 4, 118–37
  architecture 135–7
  coarse-crystalline 114, 118–24
  dissolution surfaces 118–24, 122
  environmental interpretation 121
  grass-like 124–7
  marker beds 129
  stratigraphic relations 119
selenitic gypsum 200–1, 202
sequence stratigraphy 96–8
Serikaghi Formation, Iraq 55–9
shallow-brine flat-bottomed pans
  channel structures 133–5
  depositional model 123
  grass-like selenite facies 124–7
  isochronous deposition 127–30
  marker beds 129
  microbialite deposition 133–5
  modern analogs 131–3
  non-selenite deposition 130–3
  tectonic control 137
shallow saline-type evaporite basin 107–42
  saline pans 111–15
  selenite facies 118–37
shallow water
  evaporites 7, 8
  fabric criteria 344–50
  shelf settings, Permian Basin 338
  shoals see majanna-type shoals
Sialivakou Formation 19
siliciclastic deposits
  constructional clastic body 44–5
  depth indicators 341–2
  Great Kavir Basin 73, 78
  Levant margin 37, 39–40
siliciclastic deposits (Continued)
Permian Basin 337
red mudstones 355
Zbudza Formation 254–6, 261
slope slides, clastic halite 254–6, 261
Slovakia see East Slovakian Basin
sodium sulphate salts 153
soft-sediment deformation processes 304–5
South Africa, vanished evaporites 285–308
South Atlantic pre-salt sag basins 15–35
Southeastern Brazilian highlands 28–31
Southern Apennines
fold-and-thrust belt 194
Irpinia–Daunia sector 194, 195
Monte Castello evaporites 191–218
space problem, evaporite deposition 18, 26–8, 31
Spain, natural playa–lake systems 143–54
Stebnyk potash deposit, Ukraine 265–72, 268, 270, 271, 323–4
stratification-mixing cycles 219
deep-brine pans 120–2
mixolimnion 230, 231–6
saline pans 112–14
stratified brines 3–5, 230–1
stratigraphy
Badenian gypsum facies 240–1
Berke/Ghadames Basin 90–3, 94–5, 96–8
Great Kavir Basin 69–74
isotopes 179–90
Miocene 53–4, 249, 320–1
Monte Castello evaporites 196–200, 207–9
Neoarchaean carbonates 286
Saharan evaporite basin 102
seismic 91–3, 94–5
Zechstein 279
stromatoclasts 288, 294, 300
stromatolites 8, 290–1, 294
strontium
gochemistry 205–7
isotope ratios 181, 182–3, 207
structure
Iraq 54–5
Western Alps 156
subaerial exposure 48, 355–6
subaqueous fans 261
submarine channel-mouth lobes 49–50
subsidence, salina-type basin 137
subterranean karst infill 161–3, 165
sulphates
Bilche–Volysytsa zone, Ukraine 320–2
brines, Ukraine 270
Great Kavir Basin 78
lowstand deposits 270–2
magnesium 80, 81–3, 265–73
sodium 153
sulphur isotopic composition 265–73
Ukraine 312, 317
Zbudza Formation 254–6
see also anhydrite; gypsum; selenite
sulphur isotopic composition
materials sampling 269
methods 269–70
polyhalite–anhydrite bed 271
sulphates, Ukraine 265–73
Vena del Gesso evaporites 182, 183
Sus Valley, ‘pseudocarniole’ 155–68
swirl flow pattern 228
sylvinite 76–7
sylvite
fluid inclusions 79–80, 277–83
Great Kavir Basin 76–8
homogenization temperatures 281
primary 275–84
Ukraine 266, 267, 268, 324
syn-rift deposition 15, 17–18, 25, 32
syn-rift faulting 23
synsedimentary karst features 351, 352–3
tachyhydrite 83
TAG-I see Triassic Argilo-Greseux Inferieur
tectonic activity
deposition styles 5–6
evaporite deposition 80–1
facies diversity 7–9
Kirkuk Basin 61, 66–8
Messinian 192, 193
passive basins 5–7, 8, 10
tectonic control
halite redeposition 259–61
Monte Castello evaporites 212, 213
pre-salt sag basin accommodation 18
salina-type basin deposition 137
tectonic pseudocarniole 163, 165
thenardite 147–8, 150, 152
thermal plume, South Atlantic 29, 30
thermal subsidence 32
thick-bedded selenite facies 114, 118–24
thin-bedded selenite facies 124–7
thinned continental crust 25–7
tholeiitic basalts 29, 30
timing, pre-salt sag basins 15–35
topography
Permian Basin 338–41
Walvis Ridge 24–5, 28–31
Toppo Capuana Formation 194, 196
Trento Fiumarella unit 194, 196
Tortonian, reworked evaporites 10
Transcarpathian trough, Ukraine 325–6
transgressive lag deposits 22
travertine 163, 164, 166
Trias Carbonaté 99–101
Triassic Argilo-Greseux Inferieur (TAG-I) 88, 99
Triassic, ‘pseudocarniole’ 156, 157
Triassic–Jurassic evaporites, Berke/Ghadames Basin 87–105
Tristan da Cunha plume 29, 30
Tunisia, Berke/Ghadames Basin 87–105
turbidites, gypsum 10
Ukraine, palaeocurrent analysis 229
Ukraine evaporites 309–34
Badenian basin 219–46, 221–2
Badenian gypsum deposits 116, 119, 121, 126, 129
Bilche–Volysytsa zone 320–3
Carpathian Foredeep 265–73, 318–20
Devonian 312–15
Dnipro–Donets depression 310–15
INDEX

Forecarpathian region 317
Foredobrogean trough 317–18
Jurassic 316–18
Kerch peninsula (Crimea) 327–8
Miocene 265–73, 318–28
origin 315, 325, 328
palaeocurrent analysis 225–8
Permian 313–15
sulphur isotopic composition 265–73
United States, Permian basin 335–64
vadose fabrics 351–2
vanished evaporites 285–308
Vena del Gesso evaporites 179–90
facies description 181
isotope geochemistry 187, 188
isotope stratigraphy 179, 181–8
lithology and isotope data 184–5
organic matter 182, 186
volcaniclastic layers 195, 196
Vorotyshcha potash suite, Ukraine 266, 268, 320
vuggy carbonate rocks 155–68
see also 'pseudocarniole'
Walvis ridge 24–5, 28–31
water depth determination
accumulation rates 341–2
fabric criteria 342–56
methods 337–41
water-level fluctuations
playa lakes 131–3
salina-type basins 109–11, 120–2, 123
shallow-brine pans 130
tectonic control 137
see also drawdown
water-table evaporites 350–2, 354
water transport, detrital pseudocarniole 161–3
wave-reworked fabrics 347
weld rocks 174, 175–6
West African margin, pre-salt deposits 19–20, 21
West Texas, Permian evaporites 335–64
Western Alps, 'pseudocarniole' 155–68
white halite facies 171, 172, 173
Wieliczka salt mine 259, 261
wireline log data 90, 94
Zbudza Formation 247–64
borehole lithology profiles 251
cyclicity 254–6, 261
genesis 258–61
geochemistry 256–7, 262
lithology and facies 249–54, 261
locations 250
sedimentary structures 252
Zechstein evaporites 275–84
halite inclusions 277–9
marine origin 281–3
stratigraphy 279