

# Index

References in italics are to Figures or Tables

Abbey Craig East Fault 396, 397, 398–9, 399, 400  
acid mine drainage 290, 294  
adjacent strained volume 395–9  
Afşin–Elbistan deposit 93, 95  
air pollution 261, 365, 368, 371, 374  
Al, in solution, toxicity of 291  
algal coals 201–6  
algal mats 72  
alginate 56, 108, 110, 201  
Alpine Orogeny 50  
Andano–Chulman coal-bearing region 149, 150, 151, 151, 153, 154, 155–6, 158  
vitrinite reflectance 154–5  
ankerite 289  
aquitards and aquicludes, Mšeno–Roudnice basin 421  
Asagibelova Formation 118  
Askale coalfield 124  
asphaltenes 358, 363  
atrinite 145

Badin coalfield 237, 240, 241, 242  
Baklan Granite 118  
Bälceşti coal complex 131  
Bara Formation 237  
Barbora units 24  
basin-fill  
Mšeno–Roudnice basin 412  
S Wales coalfield 162, 164–5  
Belgium, underground coal gasification 386–7  
Benátky nad Jizerou area 415  
Berbeşti Formation 131  
Berkakit Member 150, 151  
Bevercotes Colliery 257  
Beypazari deposit 88–9, 91, 98, 124, 371, 372  
Beyşehir deposit 93–4, 95  
Bicir Formation 94–5  
Bílá Hora Formation 421  
Bílá Hora (nr Plzeň)  
sandstone/claystone, Fe-oxides 35, 39–40  
tuffite, single-component remanence 33, 38–9  
Bilina delta 208  
Bilina mine 310, 310, 316, 318  
Bilthorpe Colliery, sulphur high 257  
biomarkers  
aliphatic, Maritza–Iztok lignite 219–28  
Mšeno–Roudnice basin 420, 422  
bitumen 226  
aliphatic and aromatic portions 219–20  
analyses, South Yukutian coal basin 155–8  
bituminite, Selimoglu coal 110  
bituminous coal 36  
former Czechoslovakia/Czech Republic 5, 5–7  
Mšeno–Roudnice basin 412–17, 418  
Point of Ayr 349–56  
Selimoglu unit 107  
UK, ash content reflecting mineral content 287, 292–4  
Bohemian Massif 29, 32, 33, 321, 322  
Namurian paralic basin 13–27

borehole diameter, changes in 305–6  
borehole surveys 406–7  
boron, positive correlation with sulphur 259  
British Coal database 245, 249  
Brno granitoid massif 181  
brown coal  
liquefaction by hydrogenation 357–63  
North Bohemian coal basin 208, 210–16  
Yugoslav, different forms of sulphur in 269–72  
*see also* lignite  
BS 1016 350  
Bulgaria, low rank coals 141–8  
genesis of coal macerals 145, 147  
geology of neogene deposits 141–3  
Dacian coal-bearing province 143, 147  
Sofia coal-bearing province 142, 147  
Strimon-Mesta coal-bearing province 143, 147  
Thracian coal-bearing province 142, 147  
petrology of neogene coals 143–7  
Büyük seam 118, 119, 120, 123, 126–7  
  
caking and coking properties  
Gökler coals 122  
South Yakutian coals 153, 158, 159  
calcite 69, 107, 124, 289  
camouflet shotfiring 326, 327–8  
Çan deposit 90–1, 93  
Turkey 90–1, 93  
Cândeşti Formation 131  
carbargilite 144  
<sup>13</sup>C NMR spectroscopy (CP/MAS technique)  
201–5  
carbonates 53, 110, 287, 289  
carbonization tests, Istanbul-Yenikov region  
coals 366–8  
carbons  
aromatic/alkenic 201  
and protons, aliphatic 201, 201–2, 202–4  
Carpathian Mountains 321  
Carpathian Nappes 184  
catalytic deactivation 349, 355  
Çayirhan lignite field 371, 372, 372–4  
cedrane 226  
cement clinker production plant 380, 380, 382, 383  
cenospheres 293, 362  
Central and West Bohemian Basins 29  
outline geology 33–5  
České Štredohoří Mountains 208, 263  
chalcedony 62  
channel inflows, lake stages, N Bohemian Basin 314  
charcoal *see* inertinite  
chlorite 288  
Chukurov deposit 142, 145  
Chvalteice power station 267  
Cixerri Formation 52, 53, 53–4  
clay 137  
clay minerals 144, 288, 294  
clean coal technology 10  
cleat density, near to faults 399  
cleat mineralization, late diagenetic 110  
cleating 393–4

- coal
- breccioid 124, 129
  - clayey 137
  - detrital (detric) 135, 137, 208
  - effects of low-temperature drying 365
  - forms of sulphur in 261–3
  - fragmentation upon carbonization 368
  - high organic sulphur, amelioration for burning in
    - domestic stoves 371–7
  - humic (huminitic) 153, 214
  - hypautochthonous 70
  - low rank
    - Bulgaria 141–8
    - conversion to liquid fuels by direct hydrogenation 357–63
    - desulphurization by low-temperature carbonization 365–9
    - low rank lithotypes 195–9
    - origin of vanadium in 273–86
    - as raw material for chemical industry 7
    - stages of formation 279
    - sulphur compounds in 269
    - xylite/xylitic 136, 137, 208
    - xyloedetic and semidetritic 208
    - see also* bituminous coal; brown coal; lignite
  - coal cleaning 269, 291
  - coal extractability 212, 213, 215
  - coal facies, term 131
  - coal gasification 269, 385–90
  - coal liquefaction, improvements in 349–56
    - dense medium cyclone separation 350, 351–2
    - liquefaction, original coal/coal fractions 352–5
  - coal minerals
    - and element emissions from power stations 292
    - influence on combustion residues 292–4
  - coal mines, abandoned, gas recovery from 437–8
  - coal mining, methane emissions from, Poland 425–34
  - coal rank 393
    - S Wales coalfield 166, 176
    - relationship to thrusting 161, 167–9
    - variations with depth 161, 169–71
  - coal strata, split by sediments 311, 314, 315, 316
  - coal swelling 215
  - coalbed methane
    - development in virgin coal seams 391, 438–40
    - geological controls on producibility 391, 392, 392–3, 399, 401, 404
    - migration in and around fault zones 391–408
    - models for retention and migration 401–6
    - research in the Mšeno–Roudnice Basin 409–23
    - secondary gas generation 401, 402
  - coalification 279
    - Bulgarian low rank coals 147
    - increasing with depth, Mšeno–Roudnice basin 420
    - intensity, Upper Silesian Coal Basin 20–3, 26
    - Němčický area 189, 190, 191
  - Cockshot Rock 171, 175
  - coking coal, high sulphur, Gökler coalfield 115–30
  - colliery spoil, UK 290–1
  - condont CAI values, S Wales 173
  - coquinas 56
  - Çoraklar Formation 88, 372–3
  - corphuminite 214
  - cutinite 110
  - Cypris Formation, pyrites 266
  - Czech Republic
    - coal production and usage 3–12
    - constraints on limits of mining 8–9
    - energy policy 1–2
    - workable reserves, bituminous coal 6, 6–7
  - deformation 16, 47, 165
  - degassing 401, 402
  - degassing systems, capture of methane 426, 430
  - Dejdekár volcanics 104
  - deltas, in coal-forming swamps 315–16
  - dense medium cyclone separation 350, 351–2
    - conversion and product distribution 352, 353
    - element distribution during digestion 353–4, 354
    - overflow fraction 351, 351, 352, 353, 355–6
    - underflow fraction 351, 352, 356
  - densinite 145, 214, 216
  - density gamma-gamma logging 310–11
  - depositional environments
    - and coalbed methane producibility 392–3
    - different, Kolubara and Kostolac coals 271, 272
    - KY 9 coal seam 276, 279–80
  - derelict land, restoration of, UK 290–1
  - Des-A-lupane 226, 227
  - desiccation
    - Eocene 72, 73
    - Pontian Basin 143
  - desmocolinite 103, 107–8, 110, 112
  - destressing blasting 326, 327–8
  - desulphurization 9, 272, 297
    - by low-temperature carbonization 365–9
  - detrital minerals, UK coals 287–8, 289, 294
  - detritite 214
  - diagenesis
    - deep-burial 289
    - early, formation of FeS<sub>2</sub>, KY 9 seam 279
    - marine 63
    - replacement of evaporites 62
    - Sulcis coal basin 65–7
    - and sulphur distribution in Sindh coals 240
  - diagenetic minerals, UK coals 288–9
  - dipolar phasing (DD) experiments 201
  - Dobruja coal, possible underground gasification 387–8
  - Dolní Vlkýš, siltstone 41, 42
  - dolomite 63, 66, 69, 124
  - dolomitization 72
    - post-compactional 69
  - Doupovské Hory Mountains 208, 263
  - Drahanská Vrchovina Plateau 181
  - Dukeries coal 246
  - Duraji Member 150, 158
  - Eakring Anticline 257
  - East Pennine Coalfield 406
  - EEC, Large Combustion Plant Directive 291
  - electrolinking 388
  - Elga coalfield 149, 152–3, 153, 155
  - Elhovo deposits/lignite 142, 147, 389
    - gasification in a fluidised bed 390
  - engineering stability, and weathering 289–90
  - Enna marine horizon 181
  - epigenesis 32

- Europe, present underground gasification position 386–90
- evaporites, Sulcis coal basin 63, 72, 73
- exsudatinite  
Gökler coals 124, 125–6, 126  
Selimoglu coal 110
- fault damage zones 395, 400
- fault linkages 399–400
- fault populations 400
- fault systems 34–5, 343, 394, 415  
Mšeno–Roudnice Basin 412, 414  
strike-slip 403–6
- fault zones 129, 394–5  
burial history 400  
and induced seismicity 329–35
- faults/faulting 257, 394–5  
antithetic 343  
detected on FMS data sets 406  
Kačice deposit 340, 342, 343, 347  
normal 50, 396, 401, 402  
reverse 343, 401, 404  
strike-slip 404  
virgate 343
- Fe-oxides 41
- FeS<sub>2</sub>, formation of 279, 289  
*see also* iron disulphides; pyrite
- Ffos Las OCCS 165–6, 167, 167–9
- Ffyndaff OCCS 165
- flood events, and seam splitting 258
- flue gas desulphurization 1269, 291, 372
- fluid combustion 10
- fluid migration  
fault modification of 395–400  
through unfaulted ground 393–4
- fluorinite 110
- fly ash 293, 294
- foreland basins 14, 26
- fracture systems, and permeability 399
- fractures, detected on FMS data sets 406
- fragmentograms 222, 225, 226
- France, underground coal gasification 387
- Free Swelling Index (FSI) 119, 122
- Frenštát Seismic Polygon 332
- fulvic acid 278
- furnace bottom ash 293
- fusain 144, 195, 196, 197, 198, 199
- fusanization 198, 199
- fusinite 201, 205, 281, 317
- gelification, huminite 211
- gelification index (GI) 214
- geophysical logging 406
- Germany, underground coal gasification 386
- gob wells 438, 439
- Göcüktepe sediments and alluvium 118
- goethite 39, 41
- Gökler coalfield 115–30  
caking/coking properties of coals 122  
geological setting 118–19  
iso-reflectance map/values 127–9  
mineral matter of coals 122–4
- Gökler Formation 118  
seams in 118, 118–19
- Goze Delchev deposit 143, 147
- graphitic domains 205
- gravitational sliding/slumping 50
- greenhouse gas emissions evaluation 425, 433
- grison 386
- Günes ophiolite 103
- gypsum 107
- <sup>1</sup>H NMR MAS technique 201, 204
- Hády–Řička Limestones 181
- haematite 32, 38, 41, 43, 46
- Hanioglu unit 103, 104
- Hantepe unit 103
- heat flow, S Wales coalfield 173
- heavy industry, Czechoslovakia 3–5
- Hilt's Law 189  
excursions from, S Wales 169, 171, 174, 175, 176
- Hirka Formation 88
- Holodnican Member 151, 158
- hopanes 226, 227
- Hrabák mine 262
- Hředle Member 415
- Hrušov Member 24, 26
- humic acid 278
- huminite 144, 145, 219  
N Bohemian coals 208, 211, 216
- huminite reflectance 147, 214, 358
- humoclarain 219, 221, 226
- humoclarite 144
- humotelinite 137
- humovitrain 195, 196, 197, 198, 199, 219, 220, 226
- hydrofracturing 387, 388, 407, 440
- hydrothermal fluid flow 173, 176
- hydrothermal fluids 276
- Iberian Plate 50
- illite crystallinity 167
- Ilinita Suite 229
- inelastic scatter 300
- inertinite 110, 113, 136–7, 144, 188, 219, 278, 349, 351  
N Bohemian coals 211, 214  
South Yukutian coal basin 153, 159  
*see also* fusinite
- inertodendrite 110
- iron 257
- ferric, ferrous, covalent 196–9
- iron disulphide/sulphide 211, 213, 214  
 $\delta^{34}\text{S}$  values in 261–7  
diagenetic 264, 266, 292  
epigenetic 264, 266  
syndimentary 263–4, 266, 267
- Jaklovec Member 16, 17, 21, 24, 181, 191
- jarosite 278
- Jelenice Member 412, 415
- Jerma seam, fusinite 201, 205
- Jeseniky Mountains 321
- Jiu–Motru Formation 131
- Jizera fault system 415
- jointing, and fluid migration through coal 393–4
- Juhta Member 150

- Kabakta Member 150, 151  
 Kačice deposit  
   coalfield data 339–40  
   history of 337–9  
   post-sedimentary faulting 340, 342, 343  
 Kačice depression 338  
 Kalburçayiri Formation 94  
 Kammenný Most Member 412  
 Kangal deposit 94–5, 96  
 kaolinite 124, 293  
 kaolinite precipitation 67  
 Karacahisar volcanics 118  
 Karadoruk Formation 88  
 Karakaya fault zone 129  
 Karlova deposit 96–8  
 Karsakatepe deposits 118  
 Karviná Formation 188  
 Kerme Formation 85, 87  
 Khadro Formation 237  
 Kjustendil coals 143, 144  
 Kladno Basin 6  
   reflection seismics 340, 341  
   stratigraphy of 337–9  
 Kladno coalfield 337, 342, 343  
 Kladno Formation 34, 337–8, 409, 412  
 Kladno mine 337–47  
 Kolubara coal/lignite 269, 270, 271, 271, 272, 379  
 Kolubara mines, ‘Tamnava’ field, brown coals, liquefaction by catalytic hydrogenation 357–63  
 Koprivnice–Třinec uplift 26  
 Korycany Member 421  
 Kostolac coal 269, 270, 271, 271–2  
 Kounov coals/seams 412, 415, 416  
 Kounov Member 412, 415  
 Kozloduj coal deposits 143  
 Kozluca Formation 110–11  
 Krušné Hory Fault 208  
 Krušnéhory Mountains 262  
   supplying sulphate to N Bohemian Basin 266  
 Krušnéhory piedmont coal basins 8  
 Küçük seam 118, 119, 120, 122, 123, 126–7
- lake phases, peat-swamps 313, 314–16  
 Lakhra coalfield 237, 239, 240, 241, 242  
 Lakhra Formation 237  
 Lažánky Limestones 181  
 Ledce Member 412  
 Ledce–Žilov, red claystone pit, two-component magnetization 42–3, 44  
 Leonard seam, lower whetstone 25  
 Libouš mine 314, 314  
 lignite  
   Bulgaria 147  
   Czechoslovakia/Czech Republic 4, 4, 5  
   Istanbul-Yeniköy region, low-temperature carbonization tests 365–9  
   Kolubara, use in cement rotary kilns 379–83  
   Maritza–Iztok coal basin 219–28  
   Turkey 77–99  
 lime, as sorbent for amelioration of high sulphur coal 374–6, 377
- limestone  
   dolomitic 119  
   micritic 101, 103  
   reef 181  
 Lině Formation 337, 409, 412, 415  
 lipids, bacterial 221  
 liptain 144, 195, 196, 199, 225  
   bitumen content 220, 220  
 liptinite 119, 144, 153, 159, 188, 219, 349, 351  
   N Bohemian coals 211, 214, 216  
   Selimoglu coal 103, 107, 108, 111, 113  
 liptobiolite 208  
 liptodetrinite 110, 208, 214, 216  
 Litoměřice Deep Fault 35  
 Llanharan Colliery, excursions from Hilt’s law 171, 175  
 Llannon Disturbance 167, 167  
 logging correlation scheme, N Bohemian Basin 309–20  
 Lom coal deposits 143, 147  
 Lom depression 143  
 Longannet mine, Scotland 395–9  
 Lubná seams 337, 338  
 Lužice–Labe line 419
- Macocho Formation 181  
 magnetic remanence  
   isothermal (IRM) 37, 40–1  
   multi-component 39, 41, 46  
   single-component 33, 38–9  
 magnetic remanence components, W Bohemia 29–47  
 magnetite 39, 41, 46  
 magnetization  
   chemoremanent/thermoremanent 32  
   two-component 39  
   viscous 42  
 Main coal seam, Most Formation 207–8  
   logging correlation scheme for 309–20  
 Main Ostrava Wetstone 19, 22, 25  
 Malkara deposit 85, 88  
 marcasite 262, 263, 266, 288  
 marine facies, Ostrava Formation 24  
 Maritza East deposit 142, 147, 389  
 Maritza–Iztok coal basin 195–9  
   lignite, aliphatic biological markers in 219–28  
   maximum maturity temperatures, S Wales coalfield 171, 173  
 megasequences, transgressive-regressive 51–2  
 Mělník Coals 412, 415  
 Mělník Interjacent coal seam 415  
 Mělník Main Seam 415, 415–16, 422  
   estimation of CBM reserves 416–17  
 Mengin deposit 85, 87  
 Měnin block 181, 184  
 metamorphism 166–7, 276  
 methane emission  
   Polish coal mining 425–344  
   from mining processes 426, 428  
   from post-mining activities 426, 431  
   utilization, Ostrava–Karviná coalfield 435–40  
 methane release, from coal 426, 430  
 micro-karst 53, 56  
 Mililolitic Limestone Formation 52, 67  
 Mililolitic Limestones/Produttivo Formation boundary 53

- mine gas drainage  
 from abandoned mines 437–8  
 Ostrava–Karviná coalfield 435–7
- mineral alteration, South Yakutian coal basin 158–9
- mineralization  
 antimony, Gökler coalfield 115, 116, 117, 129  
 hydrothermal 129  
 S Wales coalfield 173–4  
 sulphide, syngenetic and epigenetic 211
- mining  
 longwall, seismic energy release during 323–4, 325, 326  
 opencast/opencut/open pit 998, 149, 151, 208, 290
- Miroč seam, fusinite 201, 205
- Mirošov, ‘Lomy na Janově’ quarries, siltstone 36, 40, 46
- Mn, toxicity of 291
- Moesian Platform 143
- monosulphides 269, 271
- Moravian–Silesian Paleozoic Basin  
 paleogeographic features 25–6  
 paralic morasse 13–14, 16–24  
 partial troughs within 14–15
- Mössbauer spectroscopy 195–9, 278
- Most Formation 207–8
- Motru coal complex 131
- Mšec Member 412
- Mšeno–Roudnice Basin  
 coal deposits 412–15  
 geochemical evaluation of samples 417, 418  
 technological properties of coals 415–17  
 geological setting 409–12  
 hydrogeology 421  
 research into coalbed methane 409–23  
 thermal history 418–21
- mudrocks  
 behaviour during weathering 289  
 chemical alteration a rapid process 290
- Muğla region (Yatağan–Milas) deposits 85, 87, 89
- multicomponent statistical analysis 302, 304, 305
- Munzur limestones 110–11
- Muratdagi Melange 118, 129
- Muratdagi region 122, 129
- Myslejovice Formation 181
- Namurian paralic molasse, Bohemian Massif 13–27
- natural gas, use of 10  
 with pulverized lignite in cement rotary kiln 379–83
- Němčický area 13  
 age of coal bearing rocks/coal fragments 184–5  
 coal found in deep boreholes 179–81  
 coal petrology 185–9  
 geology of 181–4  
 S extension of Early Namurian deposits 179–93
- Nerjungra Member 150, 151
- Nerjungry coalfield 149, 156
- Nesvačilka Block 184
- Netherlands, underground coal gasification 386
- North Bohemian Coal Basin 207–17  
 analyses, elemental, petrographic and technical 209, 212–16  
 constraints on mining 8–9  
 $\delta^{34}\text{S}$  values in iron disulphides 261–7  
 geological setting 263  
 logging correlation, Main coal seam 309–20
- Northern Anatolian Fault Zone 124
- Nýřany Member 338–9, 347, 409, 412, 421  
 coal seam groups 415, 416
- Ogulbey Formation 103, 104
- Ollerton Colliery 257
- Oltenia coal basin 131–9  
 main characteristics of coal facies 134  
 main coal facies and lithotypes  
 aquatic macrophyte prairie 137–8  
 deciduous forest 135–6  
 forest swamp 136–7  
 grassy marsh *Carex* spp. 135  
 reed swamp 137
- Orhaneli deposit 91–3, 94
- orogenic trend, Variscan 24
- Orta deposit 96, 97
- Ostrava Formation 13–14, 16–24  
 changes in petrographic/geochemical composition 25, 26  
 Němčický boreholes 181, 184, 191  
 vertical changes in development of 24–5
- Ostrava–Karviná coalfield 13  
 induced seismicity related to fault zones 329–35  
 seismicity and mining situation 330–1  
 seismological monitoring 331–2  
 tectonic and geomechanical situation 330
- Karviná area  
 evaluating seismicity of tectonic zones 332  
 fault systems in 330
- methane emission and its utilization 435–40  
 coalbed methane development, virgin coal seams 438–40  
 gas recovery from abandoned mines 437–8  
 seismic monitoring for rockburst prevention 321–8  
 induced seismicity, long-term observations 322–5  
 local seismographic network 321–2  
 regional seismographic network 322  
 use of observations in geomechanical practice 325–8  
 Seismic Polygon 331–2  
 workable coal reserves 5–7  
 workable reserves 5–7
- oxidation 198, 199, 289–90
- oxides 287
- oxyhumolites 208
- Pakistan, distribution of sulphur in Sindh coals 237–43
- palaeobiotopes 133, 134
- palaeoclimate  
 Oltenia coal basin 133  
 Transcarpathians 234–5
- palaeogeography  
 development of N Bohemian Coal Basin 311–20  
 of Oltenia coal basin 132–3
- palaeogeothermal gradients, S Wales coalfield 161, 169, 170, 171–3, 176
- palaeomagnetic directions 43–4
- palaeophycoenoses, Oltenia coal basin 133–5
- palaeosalinity 259
- palaeosols 56
- palaeostress, Ostrava–Karviná basin 330
- palaeovalleys, containing coal seams 338

- palynomorph assemblages, Upper coal formation 230–6  
 parasequences, Produttivo Formation 54, 70–1  
 Park Colliery, rashings in New Shaft 171, 175  
 Park Slip OCCS 165  
 Parkgate Coal, S organic and pyritic 291, 292  
 Parkgate seam 247, 248  
   ash–sulphur relationships 253–4  
   subdivisions, E Pennine Coalfield 248  
   sulphur distribution 249–57  
     controls on 257–9  
 partial block structure, Ostrava–Karviná basin 330  
 peat accumulation, Dacic Basin 131  
 peat mire, complex controls in causing sulphur variations 258  
 peatbog phases, peat swamps 313, 316–17  
 peatbogs  
   final destruction of 317  
   metal salts in 198  
 permeability, and coalbed methane production 391, 393  
 Peruc Member 421  
 Petřkovice Member 16, 17, 20, 24  
 phosphates 287  
 phyllocladane 225  
    $\alpha$ -phyllocladane 221, 225, 226  
    $\beta$ -phyllocladane, and thermal maturity 225–6  
 Plzeň Basin 30–1, 34  
 pollution 4  
   by underground coal gasification 388, 388  
   *see also* air pollution  
 polyaromatic structures 204–5  
 porewaters 291  
   from fly ash sites, contamination source 293, 294  
   potential source of sulphate to coal seams 257–8  
   a residual sulphate reservoir 266  
 porosity, secondary, and feldspar dissolution 66–7  
 Poruba beds/Member 24, 181, 184, 191  
 power industry, coal from N Bohemian coal basin 208  
 Produttivo Formation 50, 52, 67  
   diagenetic products 65–7  
   intertidal facies 55–6  
   overlying palustrine-lacustrine facies 56  
   parasequences in 54, 70–1  
   regressive trend 60  
   subtidal facies 54–5  
   supratidal facies 56  
 Progressive Easy Slip Thrusting (PEST) 166  
 psammite tongues, N Bohemian Basin 315, 318  
 Pyrenean orogeny 50  
 pyrite 107, 144, 197, 198, 199, 250, 257, 271, 272, 288  
   containing elements of environmental concern 292, 294  
   framboidal 67, 110  
   Gökler coals 124  
   in KY 9 seam coals 278–9  
   massive 110  
   N Bohemian Basin 262, 263, 264, 266  
   oxidation of 289–90  
   and SO<sub>2</sub> emissions 291–2  
   syngenetic 214  
   underground oxidation of 290  
   *see also* iron disulphides  
   quartz mineral 122–4  
 Radčice (nr Plzeň)  
   claystone, multi-component remanence 39, 41  
   siltstone 40, 41  
 Radnice Member 337, 338, 409  
   fault detection in 340, 341  
 'rashings' 171, 175  
 reflection seismics 406  
   common-midpoint method, Kladno Basin 340, 341  
 reservoir pressure, controlling gas content 426  
 resinates 110, 144, 227  
 rockbursts 330, 334  
   seismic monitoring for prevention of 321–8  
 Rosice-Oslavany basin 57  
 rotary kiln, wet process 380, 380, 382, 383  
 Roudná (nr Plzeň), claystone, isothermal remanent magnetization 37, 40–1  
 sealing, by fault damage zones 395  
 seam plies  
   Parkgate seam 245, 258  
   ply-by-ply mapping 257, 259  
 seam splitting, and sulphur content 258  
 seam sulphur maps, generation of 249  
 sedimentary particles, petrography of, Sulcis Basin 62–5  
 sedimentation 310  
   coal-forming 311–20  
   cyclic  
     Early Namurian 181, 184  
     Nýřany Member and Týnec Formation 339  
     Oltenia coal basin 132–3  
   influence of eustatic movements on 25  
   S Wales coal basin 162, 164  
 seismic activity, natural and imposed 321  
 seismic monitoring for rockburst prevention 321–8  
 seismic reflection surveying 406  
 seismicity, induced, Ostrava–Karviná coalfield 322–5  
   relationship to fault zones 329–35  
   seismological monitoring 331–2  
   sources generated in stress concentration zones 335  
   spatial distribution of hypocentres 322–4  
   tectonic and geomechanical situation 330  
 Sekkőy Formation 87  
 Selimoglu coal field 101–14  
   geological setting and stratigraphy 102, 103–5  
   mineralogy 107  
   petrographic composition/depositional environments of coals 107–11  
 Selimoglu unit 103–4  
 semifusain 144, 195, 196, 197, 198, 199  
 Seyitömer deposit 90, 92, 124  
 siderite 65, 67  
 silicates 287  
 silicification 129  
   diagenetic 72  
 Slaný Formation 34, 337, 339, 409, 412, 421  
   coal seam groups 415  
 slip, in UK coalfields 393, 394  
 smectite, interparticle expansion of 289

- smog, Czech Republic 9–10  
 Smrčiny unit sulphides 266  
 SO<sub>2</sub> emissions 269, 374, 377  
   from pyrite and organic sulphur 272  
   and Large Combustion Plant Directive 291  
   and role of pyrite 291–2  
 soft coal 208  
 Softa-1 and Softa-2 formations 88  
 Soma deposit 87–8, 90  
 Sonahri Formation 237  
 sorbent addition, amelioration of high sulphur coal  
   374–6, 377  
 South Wales coalfield 161–78, 401  
   coal rank  
     development related to thrusting 161, 167–9  
     variation with depth 161, 169–71  
   comparison with Ruhr coal basin 176  
   metamorphism 166–7  
   role of fluids 173  
   stratigraphy 161–4  
   structure 164–6  
 South Yakutian coal basin, Siberia 149–60  
   bitumen analyses 155–8  
   Cretaceous flora 153  
   geological setting and stratigraphy 150–3  
   Jurassic flora 151, 153  
   mineral alteration 158–9  
   proximate analyses and vitrinite reflectance values  
     153–5  
 Sozopol, Gulf of, coal deposit 142  
 sparites 63  
 spectra, processing methods 301–3  
 spectra deconvolution 302, 304, 304, 306  
 spectrometric detectors 301  
 spectrometric logging probe 301  
   radius of investigation of 305  
 sphagnum 234–5  
 sporinite 110, 111, 202, 214  
   Göckler coals 124–5, 126, 129  
 stable isotopes, Sulcis coal basin 67–70  
 steranes 226  
 strain release, Ostrava–Karviná coal mines 327  
 stress fields 400, 422  
   primary and secondary 330  
 subbituminous coal, Italy 49  
 sublimation 264  
 subsidence  
   basinal 25–6  
   Němčický area 181  
   Variscan intermontane area 34  
 Sulcis coal basin, SW Sardinia 49–75  
   depositional setting 70–3  
   diagenesis 65–7  
   facies spectrum and distribution 53–60  
   geological setting, palaeogeography and  
     stratigraphy 50–2  
   petrography and geochemistry 60–5  
   revised depositional model 73  
   stable isotopes 67–70  
 sulphate 257, 269, 271, 278–9  
   reduction to sulphide 279  
 sulphate ions, leaching by meteoric waters 240  
 $\delta^{34}\text{S}$  values, in iron disulphides 261–7  
 sulphides 278, 287  
 sulphur 264, 266  
   Bey pazari coal 373–4  
   distribution  
     multi-bed seam (Parkgate seam) 245–60  
     in Sindh coals 237–43  
   elemental 261, 262  
   forms of 261–3, 269–72  
   organic 261, 269, 271, 272, 291, 374  
   pyritic 269, 271, 291, 374  
   sulphate 261, 271, 291, 374  
   sulphide 261, 262–3  
     *see also* iron disulphide; pyrite  
   volcangenic 266  
 sulphur content  
   affected by depositional and post-depositional  
     controls 257–9  
   determined through gamma spectroscopy 297–307  
   high  
     Göckler coking coal 115–30  
     Selimoglu coal 107, 113  
   Istanbul-Yeniköy region lignite 366, 366, 367  
   Main coal seam (Most Formation) 213  
   Němčický area coals 189  
   total, Göckler coals 121–2  
 $\delta^{34}\text{S}$  values, in lignite of N Bohemian Basin 264–7  
 Susta marine unit 24  
 swamp environment  
   Dacic Basin 131–8  
   Göckler coal 122  
   N Bohemian brown coal 313–18  
   Selimoglu coal 107, 110, 111  
 Syllach coalfield, bitumen analyses 155  
 syngensis 32  
  
 tasmanite (algal coal) 201, 202–4  
 tectonic dislocations, Ostrava–Karviná basin 330, 332  
 tectonics  
   extensional 50  
   tectonic zones, Bulgaria 142, 143, 147  
 telinite 159  
 telocollinite 103, 112, 119, 124  
 textinite 214  
 Tharparker coalfield 237, 238, 240, 241, 242  
 thermal demagnetization 36, 42, 42, 43, 45  
 thermal neutron capture, interferences generated in the  
   spectrum 300  
 Thracian valley, coal formation in post-tectonic  
   depression 141  
 thrust detachments, Variscan 165–6, 171, 173, 175, 176  
 thrust faults 184, 401–2, 403  
 thrust ramps 164, 165, 402, 403  
 thrusting, S Wales coalfield  
   relationship to coal rank development 167–9  
   in seam 171, 173, 176  
 tissue preservation index (TPI) 214  
 Tlustice (nr Žebrák), tuff-tuffite, two-component  
   magnetization 34, 39  
 Tokin coal-bearing region 149, 151, 151, 152–3, 153,  
   155, 158  
 toluene, use of in coal liquefaction 349  
 torbanites (algal coal) 201–2  
 trace elements, in fly ash 293–4, 294  
 transgressive cycles, Lower Eocene 70  
 trimacerites 144

- Trimsaron Disturbance 167, 167  
 triterpanes 226, 227  
 Tunçbilek deposit 89–90, 92, 124  
   Turkey 89–90, 92, 124  
 Turgut Formation 87  
 Turkey, lignite deposits 77–99  
   Eocene lignites 80–1  
   Oligocene lignites 81  
   Miocene lignites 81, 82–4, 85  
   Pliocene lignites 85, 86  
   named deposits described 85–98  
 Týnec (Tinec) Formation 34, 337, 347, 409, 415, 421  
   cyclic sedimentation in 339
- UK  
   mining data sets 406  
   underground coal gasification 387  
 UK coals, environmental impact of minerals in 287–95  
 ulminite 214, 216  
 Upper coal formation, Ilntsa Suite, floristic characters  
   of 229–6  
 Upper Silesian Coal Basin 6, 179, 191  
   Beskydy piedmont area 3–5  
   lithostratigraphy 180  
   Polish 8  
     methane content and rate of desorption 426  
     regional division according to methane content 428,  
     429, 430  
   see also Ostrava Formation; Ostrava-Karviná  
   coalfield
- USA  
   coalbed methane production 391  
   origin of vanadium, KY 9 seam 273–86  
   underground coal gasification 386, 388, 388  
 Usmun coal-bearing region 149, 150, 151, 154, 155,  
 158  
 USSR (former), underground coal gasification stations  
 385
- Valea Vişenilor coal complex 131  
 vanadium, origin of in US coals (KY 9 seam) 273–86  
   depositional environments, and thermal history  
   276–8, 279
- KY peat-forming system, physicochemical  
   conditions of deposition 283–4  
   origin of VO<sup>2+</sup>-non-P 279–80  
   origins of V from within and from above theories  
   280–1  
   primary and secondary V 281–3  
   pyrite (FeS<sub>2</sub>) and other S compounds 278–9  
 vanadylation, of KY 9 seam 279–80, 284  
 ventilation emissions of methane 426, 428, 435  
 Vilémovice Limestones 181  
 virtual pole positions, Westphalian and Stephanian  
   rocks 43–4, 45, 46, 47  
 vitrinite 153, 159, 188, 349, 351  
   Selimoglu coal 103, 107, 108, 113  
 vitrinite reflectance 129, 154, 167, 176, 276, 417, 420  
   Ffos Las OCCS 167–9  
   Němčíčky area coals 189, 191  
 volatile matter contents, Gökler coal 120–1  
 volcanic ash 235  
 volcanoclastic rocks, in Variscan foredeep 18–19  
 volcanism  
   Des Moinesian, and V in KY 9 seam 280–1, 282  
   Neogene, Turkey 88–9  
 Vršany mine 316  
 Vršany sand-clay accumulations 315  
 Vrška Čuka anthracite 201, 204–5
- weathering 46  
   minerals associated with coal 289–90  
 well logging, and use of gamma spectroscopy 297–307  
 wireline logging 406
- xylain 144, 195  
 Maritza–Iztok coal basin 195, 196, 197, 198, 199, 219,  
 220, 226  
 xylite 214
- Yamadag lava flows 105  
 Yatağan Formation 87
- Žatec delta 208, 262  
 Zdětin coals 415  
 Zdětin Horizon 412, 415  
 Žihle (red claystone pit), claystone, viscous  
   magnetization 42, 43