**Heterogeneities of seepage pore and fracture of high volatile bituminous coal core: Implications on water invasion degree**

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**Table S1** Fracture porosity, minerals’ filling porosity, connected fracture porosity and unconnected fracture porosity of each section (section 1 corresponded to the flooding inlet end).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Section  No. | Porosity (%) | | | |
| Fracture | minerals’  filling | Connected  fracture | Unconnected  fracture |
| 1 | 1.21 | 0.80 | 1.00 | 0.21 |
| 2 | 0.93 | 1.15 | 0.75 | 0.18 |
| 3 | 0.87 | 0.96 | 0.70 | 0.17 |
| 4 | 0.48 | 0.82 | 0.24 | 0.24 |
| 5 | 0.78 | 0.97 | 0.69 | 0.09 |
| 6 | 0.46 | 1.11 | 0.24 | 0.23 |
| 7 | 0.39 | 0.61 | 0.32 | 0.08 |
| 8 | 0.37 | 0.68 | 0.26 | 0.11 |
| 9 | 0.27 | 0.75 | 0.08 | 0.19 |
| 10 | 0.20 | 1.66 | 0.07 | 0.13 |
| Max. | 1.21 | 1.66 | 1.00 | 0.24 |
| Min. | 0.20 | 0.61 | 0.07 | 0.08 |
| Avg. | 0.59 | 0.95 | 0.44 | 0.16 |

**Table S2** Parameters of each section extracted from MIP test.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Section No. | DP (MPa) | MCP (MPa) | MPD (nm) | IMS (%) | EMW (%) | Pore volume distribution (%) | | | | Total volume (×10-3 mL/g) |
| V1 | V2 | V3 | V4 |
| 1 | 0.80 | 8.96 | 69.5 | 92.0 | 57.8 | 27.0 | 49.8 | 11.6 | 11.6 | 65.4 |
| 2 | 0.80 | 9.14 | 68.2 | 91.6 | 55.1 | 25.3 | 48.2 | 13.6 | 13.0 | 69.3 |
| 3 | 0.83 | 8.97 | 69.4 | 91.2 | 50.9 | 23.2 | 48.2 | 16.6 | 12.1 | 73.6 |
| 4 | 0.83 | 9.20 | 67.6 | 91.0 | 50.6 | 22.8 | 48.4 | 16.2 | 12.5 | 75.1 |
| 5 | 0.81 | 9.32 | 66.8 | 90.4 | 49.4 | 21.6 | 47.2 | 19.2 | 12.0 | 79.5 |
| 6 | 0.90 | 9.77 | 63.7 | 90.3 | 48.0 | 20.9 | 48.3 | 20.3 | 10.6 | 80.4 |
| 7 | 0.96 | 9.53 | 65.3 | 90.4 | 47.7 | 20.3 | 49.4 | 19.6 | 10.6 | 80.2 |
| 8 | 0.97 | 9.74 | 63.9 | 90.2 | 47.1 | 18.5 | 48.8 | 21.4 | 11.3 | 82.5 |
| 9 | 0.98 | 9.87 | 63.1 | 90.4 | 48.2 | 20.3 | 50.1 | 19.9 | 9.7 | 80.1 |
| 10 | 1.03 | 9.70 | 64.2 | 90.2 | 45.7 | 19.7 | 46.4 | 21.1 | 12.9 | 81.6 |
| Max | 1.03 | 9.87 | 69.5 | 92.0 | 57.8 | 27.0 | 50.1 | 21.4 | 13.0 | 82.5 |
| Min | 0.80 | 8.96 | 63.1 | 90.2 | 45.7 | 18.5 | 46.4 | 11.6 | 9.7 | 65.4 |
| Avg | 0.89 | 9.42 | 66.2 | 90.8 | 50.1 | 22.0 | 48.5 | 17.9 | 11.6 | 76.8 |

Abbreviations: DP = Displacement pressure; MCP = Median capillary pressure; MPD = Median pore diameter; IMS = Injection of mercury saturation; EMW = Efficiency of mercury withdrawal; V1 = micro-pores; V2 = transition pores; V3 = meso-pores; V4 = macro-pores. Max = the maximum value; Min = the minimum value; Avg = the average value.

**Table S3** Fractal dimensions of each section

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Section No. | Volumetric fractal dimensions | | | | | Surface fractal dimensions |
| D1 | D2 | D3 | D4 | D3+D4 | DS |
| 1 | 3.7465 | 3.3607 | 3.7658 | 3.0721 | 6.8379 | 2.9489 |
| 2 | 3.7004 | 3.3842 | 3.4755 | 3.0805 | 6.556 | 2.9462 |
| 3 | 3.5317 | 3.2335 | 3.8481 | 3.1012 | 6.9493 | 2.9503 |
| 4 | 3.6344 | 3.1862 | 3.9127 | 3.1018 | 7.0145 | 2.9493 |
| 5 | 3.5824 | 3.1751 | 3.6578 | 3.1371 | 6.7949 | 2.9501 |
| 6 | 3.7356 | 3.1283 | 3.7714 | 3.1527 | 6.9241 | 2.9536 |
| 7 | 3.5984 | 3.0871 | 3.7949 | 3.1299 | 6.9248 | 2.9534 |
| 8 | 3.8167 | 2.9951 | 4.0622 | 3.1336 | 7.1958 | 2.9524 |
| 9 | 3.5996 | 3.0723 | 3.8707 | 3.1666 | 7.0373 | 2.9553 |
| 10 | 3.6499 | 3.1091 | 3.8122 | 3.1415 | 6.9537 | 2.9479 |
| Max | 3.8167 | 3.3842 | 4.0622 | 3.1666 | 7.1958 | 2.9553 |
| Min | 3.5317 | 2.9951 | 3.4755 | 3.0721 | 6.5560 | 2.9462 |
| Avg | 3.6596 | 3.1732 | 3.7971 | 3.1217 | 6.9188 | 2.9507 |

Abbreviations: Max = the maximum value; Min = the minimum value; Avg = the average value.