Correlation of Field Barometer to KGS Petrophysics Lab Barometer

FIGURE 1.

Correlation of Field Barometer to KGS Petrophysics Lab Barometer

FIGURE 1.
677.8' to 678.8' (Excello Shale) in canister MER B
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

- Volume of desorbed gas (cc @ STP)
- Elapsed time (off-bottom to canister) = 0.783
  = \sqrt{0.613} \text{ hrs.}
  = 36.8 \text{ min.}
- 63 cc estimated lost gas

Square root of hours since core was off bottom

Figure 2.
681.5' to 682.4' (Excello Shale) in canister MER G
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

elapsed time (off-bottom to canister)
= 0.478
= SQRT(0.228 hrs.)
= 13.7 min.

Figure 3.

volume of desorbed gas (cc @ STP)

square root of hours since core was off bottom
682.4' to 683.2' (Mulky coal) in canister MER 3
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Elapsed time (off-bottom to canister) = 0.408
= SQRT(0.166 hrs.)
= 10.0 min.

Figure 4.
Figure 5.

706.0' to 707.0' (Iron Post coal) in canister B
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Elapsed time (off-bottom to canister) = 0.398 = \sqrt{0.158 \text{ hrs.}} = 9.5 \text{ min.}

Volume of desorbed gas (cc @ STP)

125cc estimated lost gas

Square root of hours since core was off bottom
731.5' to 732.2' (Croweburg coal) in canister 10
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Elapsed time (off-bottom to canister) = 0.423
= SQRT(0.179 hrs.)
= 10.7 min.

97cc estimated lost gas

Figure 6.
772.0' to 773.0' (Mineral coal) in canister 11
Layne-Christensen Beurksens #13-28; SW SW 28-T.31S.-R.16E.

elapsed time (off-bottom to canister) = 0.423
= SQRT(0.179 hrs.)
= 10.7 min.

205cc estimated lost gas

volume of desorbed gas (cc @ STP)

square root of hours since core was off bottom
838.3' to 839.1' (Tebo coal) in canister L
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Elapsed time (off-bottom to canister) = 0.519
= SQRT(0.269 hrs.)
= 16.1 min.

Volume of desorbed gas (cc @ STP)

Square root of hours since core was off bottom

Figure 8.
847.0' to 848.0' (Weir-Pittsburg coal) in canister 9 Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Elapsed time (off-bottom to canister) = 0.514 = SQRT(0.264 hrs.) = 15.8 min.

Figure 9.
848.0' to 849.0' (Weir-Pittsburg coal) in canister A  
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

\[
\text{elapsed time (off-bottom to canister)} = 0.553 = \sqrt{0.306 \text{ hrs.}} = 18.4 \text{ min.}
\]

Figure 10.
888.2' to 889.2' (Bluejacket coal) in canister MER E
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Figure 11.

elapsed time (off-bottom to canister)
= 0.508
= SQRT(0.258 hrs.)
= 15.5 min.

volume of desorbed gas (cc @ STP)

105cc estimated lost gas

square root of hours since core was off bottom
1003.7' to 1004.7' (Rowe coal) in canister MER D
Layne-Christensen Beurksens #13-28; SW SW 28-T.31S.-R.16E.

Figure 12.

\[
\text{elapsed time (off-bottom to canister)} = 0.486 = \sqrt{0.236 \text{ hrs.}} = 14.2 \text{ min.}
\]

volume of desorbed gas (cc @ STP)

square root of hours since core was off bottom

505cc estimated lost gas
1053.7' to 1054.7' (Riverton coal) in canister MER F
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Elapsed time (off-bottom to canister)
= 0.466
= SQRT(0.217 hrs.)
= 13.0 min.

Figure 13.

Graph showing the volume of desorbed gas (cc @ STP) against the square root of hours since the core was off bottom. The graph includes a point at 350cc estimated lost gas.
1054.7' to 1055.7' (Riverton coal) in canister 5
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E.

Elapsed time (off-bottom to canister)
= 0.500
= SQRT(0.250 hrs.)
= 15.0 min.

410cc estimated lost gas

Figure 14.
Desorption Characteristics of Excello Shale (677.8' to 682.4')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

GAS CONTENT (scf/ton) (dry wt., counting lost gas)

TIME (square root of hours since bottom hole time of core)
Desorption Characteristics of Mulky coal (682.4' to 683.2')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

GAS CONTENT (scf/ton) (dry wt., counting lost gas)

TIME (square root of hours since bottom hole time of core)

FIGURE 16.
Desorption Characteristics of Iron Post coal (706.0' to 707.0')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

GAS CONTENT (scf/ton) (dry wt., counting lost gas)

TIME (square root of hours since bottom hole time of core)
Desorption Characteristics of Croweburg coal (731.5' to 732.2')

Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

GAS CONTENT (scf/ton) (dry wt., counting lost gas)

TIME (square root of hours since bottom hole time of core)

FIGURE 18.
Desorption Characteristics of Mineral coal (772.0' to 773.0')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

TIME (square root of hours since bottom hole time of core)
Desorption Characteristics of Tebo coal (838.3' to 839.1')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

TIME (square root of hours since bottom hole time of core)

FIGURE 20.
Desorption Characteristics of Weir-Pittsburg coal (847.0' to 849.0')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

GAS CONTENT (scf/ton) (dry wt., counting lost gas)

TIME (square root of hours since bottom hole time of core)

FIGURE 21.
Desorption Characteristics of Bluejacket coal (888.2' to 889.2')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

GAS CONTENT (scf/ton) (dry wt., counting lost gas)

FIGURE 22.
Desorption Characteristics of Rowe coal (1003.7' to 1004.7')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

GAS CONTENT (scf/ton)
(dry wt., counting lost gas)

TIME (square root of hours since bottom hole time of core)

FIGURE 23.
Desorption Characteristics of Riverton coal (1053.7' to 1055.7')
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

**GAS CONTENT**
(scf/ton)
(dry wt., counting lost gas)

**TIME** (square root of hours since bottom hole time of core)

**FIGURE 24.**
Desorption Characteristics of Coal and Shale Samples
Layne-Christensen Beurskens #13-28; SW SW 28-T.31S.-R.16E., Montgomery Co., KS

![Graph showing desorption characteristics of coal and shale samples.](image)

**Figure 25.**
Sorption Time of Coal and Shale Samples

SORPTION TIME vs. GAS CONTENT

FIGURE 26.
ISOTOPIC COMPOSITION and WETNESS by STRATIGRAPHIC POSITION of coalbed gases in eastern Kansas

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<th>WETNESS (%)</th>
<th>δ¹³C METHANE (‰)</th>
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<td>-40</td>
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Figure 27.
Gas Reserves and Relative Deliverability

FIGURE 29.