

V A R I A T I O N  
O F  
C O A L I N T H E S E A M.

Dip. Thesis,

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My problem was to find the variation of composition of the coal throughout the seam.

To do this I got samples at certain intervals from top to bottom of the seam and analyzed them. The analyses included moisture, volatile combustible matter, fixed carbon, ash and sulphur.

These constituents were determined by the "Proximate" analysis, check analysis being run.

To determine the sulphur, instead of precipitating the sulphur with  $\text{BaCl}_2$ , as  $\text{BaSO}_4$  and working out the per cent of sulphur ~~geometrically~~ <sup>gravimetrically</sup> I compared the intensity of the precipitate with that of known strength. When a precipitate of the same intensity as the one under investigation was gotten the strength of my standard solution being known I could tell right off the per cent of sulphur in the sample. This method of determining sulphur is a great time and labor saver and is accurate after a person has practiced it a little while.

My standard solution was a  $\text{K}_2\text{SO}_4$  solution which was made by dissolving dry  $\text{K}_2\text{SO}_4$  in distilled water. (I had to test all of the water I used for sulphur.) The strength of the solution was 0.005 gram to 1 cc.

The samples I used in my investigation were gotten in Kanawha County, W. Va., on Cabin Creek. Three of the samples were from the "No. 2 Gas" seam which is 3' 6" thick at the place the samples were gotten. One sample was from the top, another from the center and the other from the bottom.

Four of the samples were taken from the "No. 5 Splint" seam which is 4' thick and the samples were taken at equal intervals from top to bottom.

A great variation in the coal of the Gas seam was found but not much in the Splint coal as will be seen by the following data of my work.

"NO. 2 GAS" SEAM TOP.

Sample A		Sample B	
Wt of Cruc.	9.4388 gm	Wt of Cruc	7 7.6074
" " Coal	1.0000 "	" " Coal	1.0000
" " " & Cruc	<u>10.4388</u> "	" " " & Cruc	<u>8.6074</u>
	10.4388		8.6074
2nd wt.	<u>10.4262</u>	2nd wt.	<u>8.5942</u>
Moisture	.0126	Mois.	.0132
	9.5743		7.7437
2nd wt.	<u>9.4388</u>	2nd wt.	<u>7.6074</u>
Ash	.1355	Ash	.1363
	11.9523		11.9342
Wt. of Cruc.	11.9523	Wt. of Cruc	11.9342
" " Coal	1.0000	" " Coal	1.0000
" " " & Cruc	<u>12.9523</u>	" " " & Cruc	<u>12.9342</u>
	12.5873		12.5680
2nd wt.	<u>11.9523</u>	2nd wt.	<u>11.9342</u>
Coke	.6350	Coke	.6338

Mean Values.

Mois. .0129  
Ash .1359  
Coke .6344

$1.0000 - 63.44 = .3656 = 36.56\%$

$.6344 - .1359 = .4985 = 49.85\% = \text{F.C.}$

$36.56 - 1.29 = 35.27\% = \text{V. C. M.}$

49.85 F. C.  
35.27 V. C. M.  
1.29 Mois.  
13.59 Ash  
100.00 Total

Mois. 1.29%    V. C. M. 34.15%    F.C. 49.97%    Ash. 13.59%    Sul. 1.2%

No.2 Gas Seam Center.

Sample A

Sample B

Wt of Cruc. 7.5375316  
 " " Coal 1.0010000  
 " " " & Cruc 8.5316

Wt. of Cruc. 7.5911  
 " " Coal 1.0000  
 " " " & Cruc 8.5911

2nd wt. 8.5316  
 8.5154  
 Mois. .0162

2nd wt. 8.5911  
 8.5755  
 Mois. .0156

2nd wt. 7.5458  
 7.5316  
 Ash .0142

2nd wt. 7.6055  
 7.5911  
 Ash .0144

Wt. of Cruc 11.9340  
 " " Coal 1.0000  
 " " " & Cruc 12.9340

Wt. of Cruc 11.9523  
 " " Coal 1.0000  
 " " " & Cruc 12.9523

2nd wt. 12.5330  
 11.9340  
 Coke .5990

2nd wt. 12.5308  
 11.9340  
 Coke .5968

Mean Values

Mois. 1.59  
 Ash 1.43  
 Coke 59.79

$1.0000 - .5979 = .4021 = 40.21\%$

$40.21 - 1.59 = 38.62\% = V. C. M.$

$59.79 - 1.43 = 58.36\% F. C.$

58.36 F. C.  
 38.62 V. C. M.  
 1.43 Ash  
 1.59 Mois.  
 Total 100.00

Mois.	V. C. M.	F. C.	Ash	Sol.
1.59%	38.62%	58.36%	1.43%	.82%

NO. 2 GAS SEAM BOTTOM.

Sample A		Sample B	
Wt. of Cruc	9.4383	Wt. of Cruc	7.6072
" " Coal	1.0000	" " Coal	1.0000
" " " & Cruc	<u>10.4383</u>	" " " & cruc	<u>8.6072</u>
2nd wt.	10.4383	2nd wt.	8.6072
Mois.	<u>10.4243</u>	Mois.t.	<u>8.5937</u>
	.0140		.0135
2nd wt.	9.4578	2nd wt.	7.6262
Ash	<u>9.4383</u>	Ash	<u>7.6072</u>
	.0195		.0190
Wt. of Cruc	11.9532	Wt. of Cruc.	11.9340
" " Coal	1.0000	" " Coal	1.0000
" " " & Cruc.	<u>12.9532</u>	" " " &Cruc	<u>12.9340</u>
2nd wt.	12.5606	2nd wt.	12.5417
Coke	<u>11.9572</u>	Coke	<u>11.9340</u>
	.6074		.6077

Mean Values.

Mois. 1.375  
 Ash 1.925  
 Coke 60.755

$$1.0000 - .60755 = .39.245\% - 1.375 = 37.87\% = \text{V. C. M.}$$

$$60.755 - 1.925 = 58.83\% = \text{F. C.}$$

	58.83	F. C.
	38.62	V. C. M.
	1.375	Mois.
	1.925	Ash
Total	<u>100.00</u>	

Mois.	V. C. M.	F. C.	Ash	Sul.
1.375%	37.87%	58.83%	1.925%	.9%

No.5 Splint Bottom No.1.

Sample A

Sample B

Wt of Cruc	9.4387
" " Coal	1.0000
" " " & Cruc	<u>10.4387</u>

Wt of Cruc	7.6074
" " Coal	1.0000
" " " & Cruc	<u>8.6074</u>

2nd wt	10.4387
Mois	<u>10.4223</u>
	.0163

2nd wt	8.6074
Mois	<u>8.5915</u>
	.0159

2nd wt	9.5004
Ash	<u>9.4387</u>
	.0617

2nd wt	7.6700
Ash	<u>7.6074</u>
	.0626

Wt of Cruc	11.9343
" " Coal	1.0000
" " " & Cruc	<u>12.9343</u>

Wt of Cruc	11.9521
" " Coal	1.0000
" " " & Cruc	<u>12.9521</u>

2nd wt	12.5413
Coke	<u>11.9343</u>
	.6076

2nd wt	12.5579
Coke	<u>12.9521</u>
	.6038

Mean Values

Mois	1.62
Ash	6.213
Coke	60.76

$$1.000 - .6076 = .3924 = 39.24\% - 1.62 = 37.62 = \text{V. C. M.}$$

$$.6076 - .06215 = .54545 = 54.545\% = \text{F. C.}$$

Mois.	V. C. M.	F. C.	Ash	Sul.
1.62%	37.62%	54.545%	6.215%	.95%

"NO. 5 SPLINT" NEXT TO BOTTOM #2.

Sample A		Sample B	
Wt of Cruc	7.5911	Wt of Cruc	7.5313
" " Coal	1.0000	" " Coal	1.0000
" " " & Cruc	<u>8.5911</u>	" " " & Cruc	<u>8.5313</u>
2nd wt.	8.5911	2nd wt.	8.5313
Mois	<u>8.5737</u>	Mois	<u>8.5140</u>
	.0174		.0173
2nd wt.	7.7246	2nd wt.	7.6508
Ash	<u>7.6071</u>	Ash	<u>7.5313</u>
	.1175		.1195
wt of Cruc	11.9523	Wt of Cruc	11.9340
" " Coal	1.0000	" " Coal	1.0000
" " " & Cruc	<u>12.9523</u>	" " " & Cruc	<u>12.9340</u>
2nd wt.	12.5819	2nd wt.	12.5632
Coke	<u>11.9523</u>	Coke	<u>11.9340</u>
	.6296		.6292

M E A N V A L U E S.

Mois 1.735  
 Ash 11.85  
 Coke 62.94

$$1.000 - .6294 = .3706 = 37.06\% - 1.735 = 35.325\% = \text{V. C. M.}$$

$$.6294 - .1185 - .5109 = 51.09\% = \text{F. C.}$$

	51.09	F. C.
	35.325	V. C. M.
	1.735	Mois
	11.83	Ash
Total	<u>100.00</u>	

Mois.	V. C. M.	F. C.	Ash	Sol.
1.735%	35.325%	51.09%	11.85%	1.33%

"NO. 5 SPLINT" NEXT TO TOP #3.

Sample A		Sample B	
Wt of Cruc	7.5910	Wt of Cruc	7.5314
" " Coal	1.0000	" " Coal	1.0000
" " " & Cruc	<u>8.5910</u>	" " " & Cruc	<u>8.5314</u>
	8.5910		8.5314
2nd wt.	8.5745	2nd wt.	8.5134
Mois	<u>.0165</u>	Mois	<u>.0175</u>
	8.5910		8.5314
2nd wt	7.7012	2nd wt	7.6435
	7.5910		7.5314
Ash	<u>.1102</u>	Ash	<u>.1121</u>
	7.7012		7.6435
Wt of Cruc	11.9524	Wt of Cruc	11.9343
" " Coal	1.0000	" " Coal	1.0000
" " " & Cruc	<u>12.9524</u>	" " " & Cruc	<u>12.9343</u>
	11.9524		11.9343
2nd wt.	12.5769	2nd wt	12.5606
	11.9524		11.9343
Coke	<u>.6245</u>	Coke	<u>.6263</u>
	12.5769		12.5606

Mean Values.

Mois 1.71  
 Ash 11.115  
 Coke 62.54

1.000-.6254 .3746 37.46%-1.71 35.75 V. C. M.

.6254-.11115 .51425 51.425% F. C.

51.425 F. C.  
 35.75 V. C. M.  
 1.71 Mois  
 11.115 Ash  
 Total 100.00

Mois.	V. C. M.	F. C.	Ash	Sul.
1.71%	35.75%	51.425%	11.115%	1.85%



"NO. 5 SPLINT" TOP #4.

Sample A			Sample B		
Wt of Cruc	9.4388		Wt of Cruc	7.6074	
" " Coal	1.0000		" " Coal	1.0000	
" " " & Cruc	<u>10.4388</u>		" " " & Cruc	<u>8.6074</u>	
2nd wt	10.4388		2nd wt	8.6074	
Mois	<u>10.4271</u>		Mois	<u>8.5950</u>	
	.0117			.0124	
2nd wt	9.5820		2nd wt	9.5833	
Ash	<u>9.4388</u>		Ash	<u>9.4385</u>	
	.1432			.1448	
Wt of Cruc	11.9523		Wt of Cruc	11.9342	
" " Coal	1.0000		" " Coal	1.0000	
" " " & Cruc	<u>12.9523</u>		" " " & Cruc	<u>12.9342</u>	
2nd wt.	12.5985		2nd wt o	12.5792	
Coke	<u>11.9523</u>		Coke	<u>11.9342</u>	
	.6462			.6450	

Mean Values.

Mois 1.205  
Ash 14.40  
Coke 64.56

$$1.000 - .6456 = .3544 = 35.44\% - 1.205 = 34.235\% = \text{V. C. M.}$$

$$.6456 - .1440 = .5016 = 50.16\% = \text{F. C.}$$

50.16 F. C.  
34.235 V. C. M.  
14.40 Ash  
1.205 Mois  
Total 100.00

Mois	V. C. M.	F. C.	Ash	Sul
1.205%	34.235%	50.16%	14.40%	1.21%