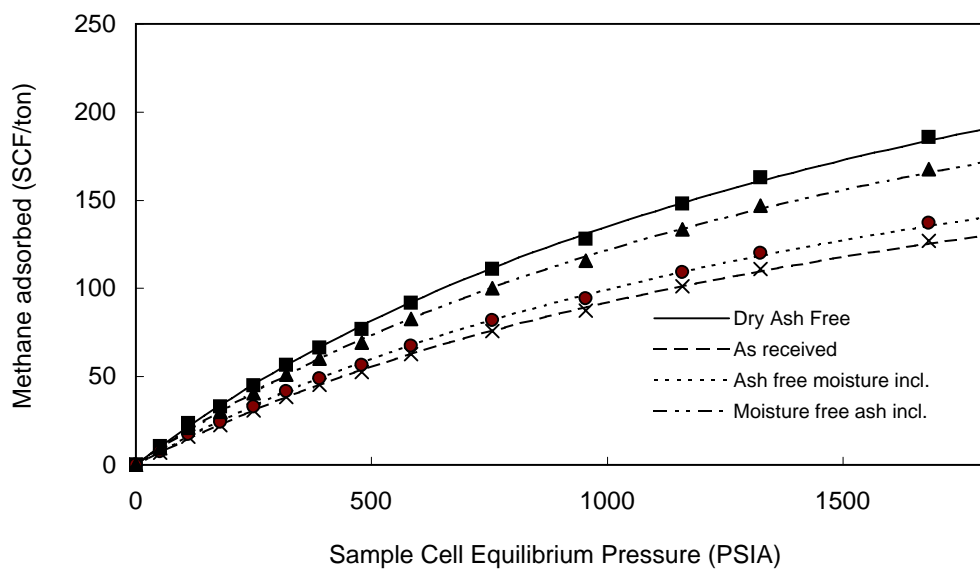


## 9-1A Methane



Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)			
	As Received	moisture free ash incl.	ash free moisture incl.	Dry Ash Free
51	7.1	9.3	7.6	10.4
111	16.1	21.2	17.3	23.5
179	22.7	29.9	24.5	33.2
249	30.7	40.5	33.1	44.9
319	38.6	51.0	41.7	56.6
390	45.5	60.1	49.1	66.6
479	52.5	69.4	56.7	76.9
583	62.6	82.7	67.6	91.7
756	75.8	100.2	81.9	111.0
954	87.5	115.6	94.5	128.1
1159	101.1	133.6	109.2	148.0
1324	111.2	146.9	120.0	162.8
1682	127.0	167.8	137.1	185.9

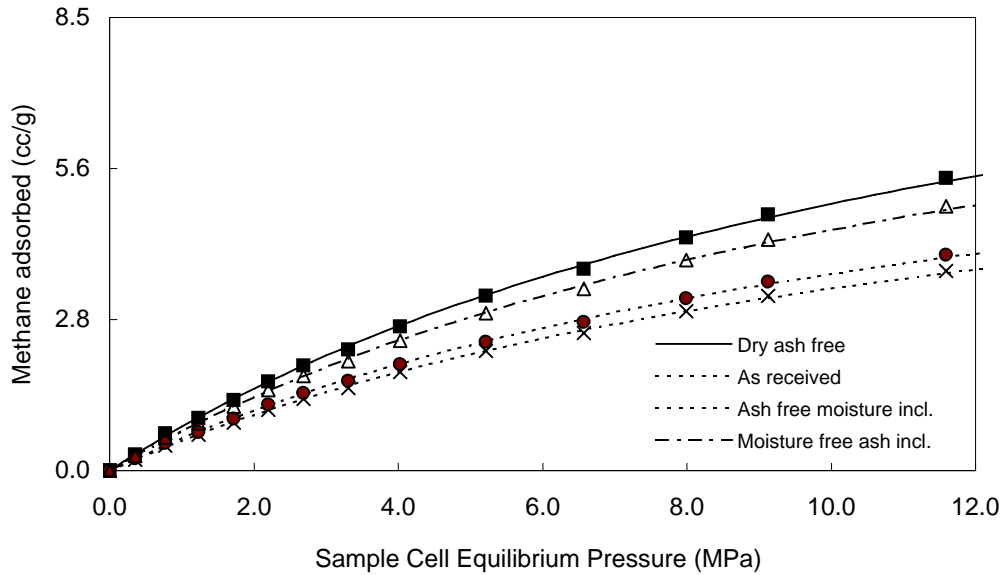
### Langmuir Parameters

	As Received	Moisture free ash incl	Ash free moisture incl	Dry Ash Free
Vol. (ft <sup>3</sup> /ton)	266.3	351.8	287.5	389.8
Pressure (PSIA)	1885.1	1885.1	1885.1	1885.1

### SUMMARY OF ADSORPTION ANALYSES IMP. UNITS

Isotherm Temperature: 97.0 °F  
 Goodness of fit of Langmuir regression: 0.99  
 % Ash= 7.39      % Moisture= 24.31      Density g/cc 1.308

## 9-1A Methane



Pressure (MPa)	Adsorbed gas (cc/g)			
	As Received	Moisture free ash incl.	ash free moisture incl	Dry Ash Free
0.353	0.21	0.27	0.22	0.30
0.768	0.47	0.62	0.51	0.69
1.236	0.67	0.88	0.72	0.98
1.718	0.90	1.19	0.97	1.32
2.201	1.14	1.50	1.23	1.66
2.690	1.34	1.77	1.44	1.96
3.305	1.54	2.04	1.67	2.26
4.022	1.84	2.43	1.99	2.69
5.216	2.23	2.94	2.41	3.26
6.575	2.57	3.40	2.78	3.77
7.989	2.97	3.93	3.21	4.35
9.130	3.27	4.32	3.53	4.78
11.595	3.73	4.93	4.03	5.46

### Langmuir Parameters

	As Received	Moisture free ash incl.	Ash free moisture incl	Dry Ash Free
Vol. (cc/g)	7.83	10.34	8.45	11.46
Pressure (MPa)	13.00	13.00	13.00	13.00

### SUMMARY OF ADSORPTION ANALYSES SI UNITS

Isotherm Temperature:

36.1 °C

Goodness of fit of Langmuir regression:

0.99

% Ash= 7.39

% Moisture =

24.31

Density (g/cc)

**1.308**

**9-1A Methane**  
**GAS ADSORPTION ISOTHERM IMPERIAL UNITS**

**AS RECEIVED BASIS**

Isotherm Temperature ° F:	97.0	Moisture Content % :	24.31
Gas used:	Methane	Ash Content, % :	7.39
		Helium Density g/cc	1.308

PRESSURE (PSI)	ADSORBED GAS (SCF/ton)	P / V
51	7.07	7.23
111	16.06	6.94
179	22.67	7.91
249	30.66	8.13
319	38.63	8.26
390	45.47	8.58
479	52.54	9.12
583	62.60	9.32
756	75.83	9.98
954	87.51	10.90
1159	101.11	11.46
1324	111.17	11.91
1682	126.99	13.24

Saturated Monolayer Volume (SCF/ton):	266.3
Langmuir Pressure (PSIA):	1885.1
Correlation Coefficient:	0.9883

**DRY ASH FREE BASIS**

51	10.36	4.94
111	23.51	4.74
179	33.19	5.40
249	44.90	5.55
319	56.56	5.64
390	66.57	5.86
479	76.93	6.23
583	91.66	6.36
756	111.02	6.81
954	128.12	7.44
1159	148.04	7.83
1324	162.77	8.14
1682	185.92	9.05

Saturated Monolayer Volume (SCF/ton, daf):	390
Langmuir Pressure (PSIA):	1885
Correlation Coefficient:	0.9883

## 9-1A Methane

### Methane Adsorption (Imperial Units)

#### ***Summary of Analyses***

	As Received	DAF basis
Langmuir Volume (SCF)	266	390
Langmuir Pressure (PSIA)	1885	1885
Goodness of fit Langmuir		
Equation R-squared	0.99	0.99
Ash Content Wt.%	7.39	7.39
Equilibrium Moisture Wt.%	24.31	24.31

#### **Contents of Appendix**

##### ***data sheets***

As Received  
Dry Ash Free  
Dry Ash Included  
Moist Ash Free

##### ***Charts***

As Received  
Dry Ash Free  
Dry Ash Included  
Moist Ash Free

## 9-1A Methane

### GAS ADSORPTION ISOTHERM IMPERIAL UNITS

#### MOISTURE FREE ASH INCLUDED

Isotherm Temperature° F:	97.0	Moisture Content % :	24.31
Gas used:	Methane	Ash Content, % :	7.39
		Helium Density g/cc	1.308

PRESSURE (PSI)	ADSORBED GAS (SCF/ton)	P / V
51	9	5.47
111	21	5.25
179	30	5.99
249	41	6.15
319	51	6.25
390	60	6.50
479	69	6.91
583	83	7.05
756	100	7.55
954	116	8.25
1159	134	8.67
1324	147	9.02
1682	168	10.02

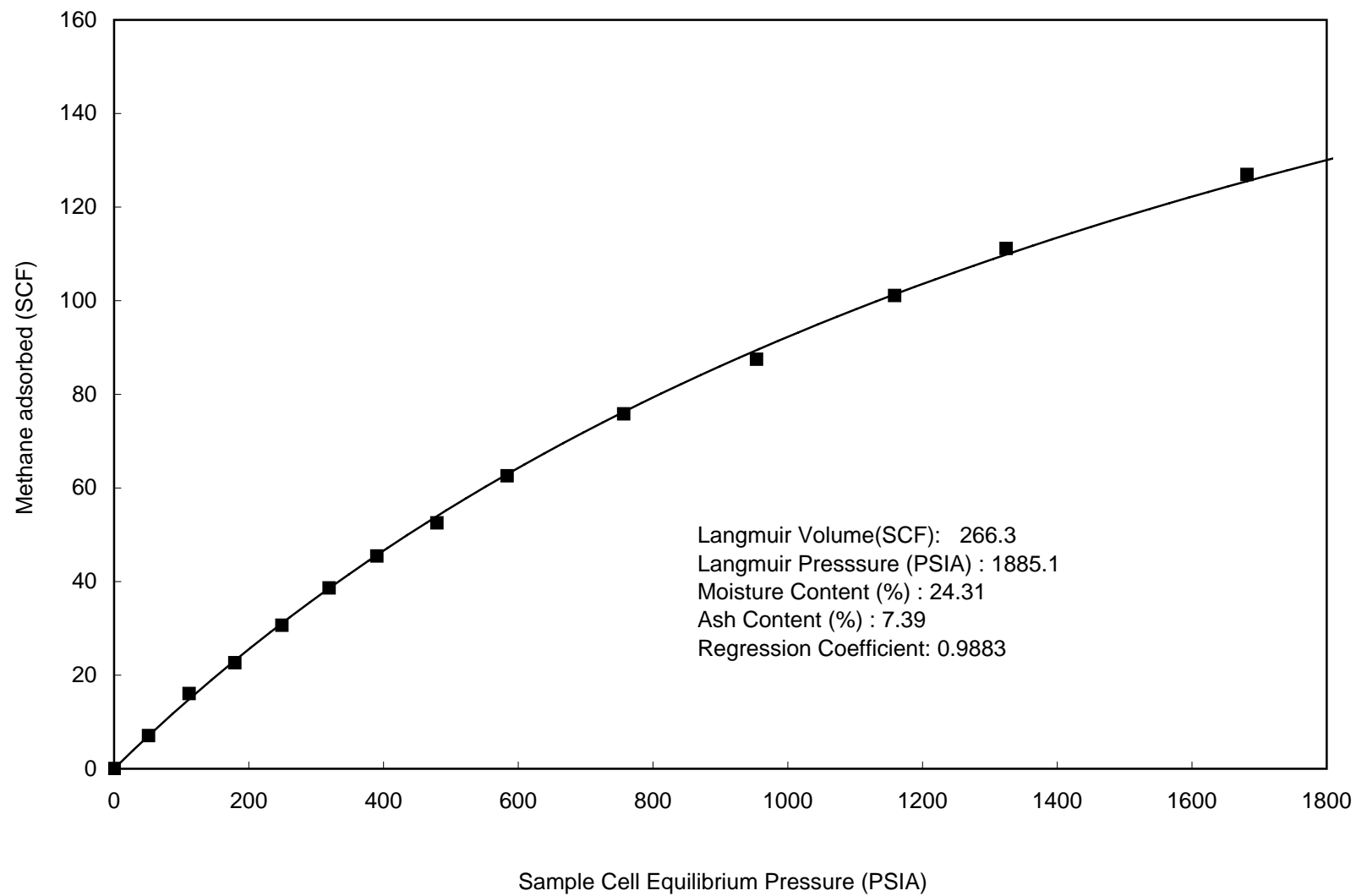
Saturated Monolayer Volume (SCF/ton):	352
Langmuir Pressure (PSIA):	1885
Correlation Coefficient:	0.9883

#### ASH FREE MOISTURE INCLUDED

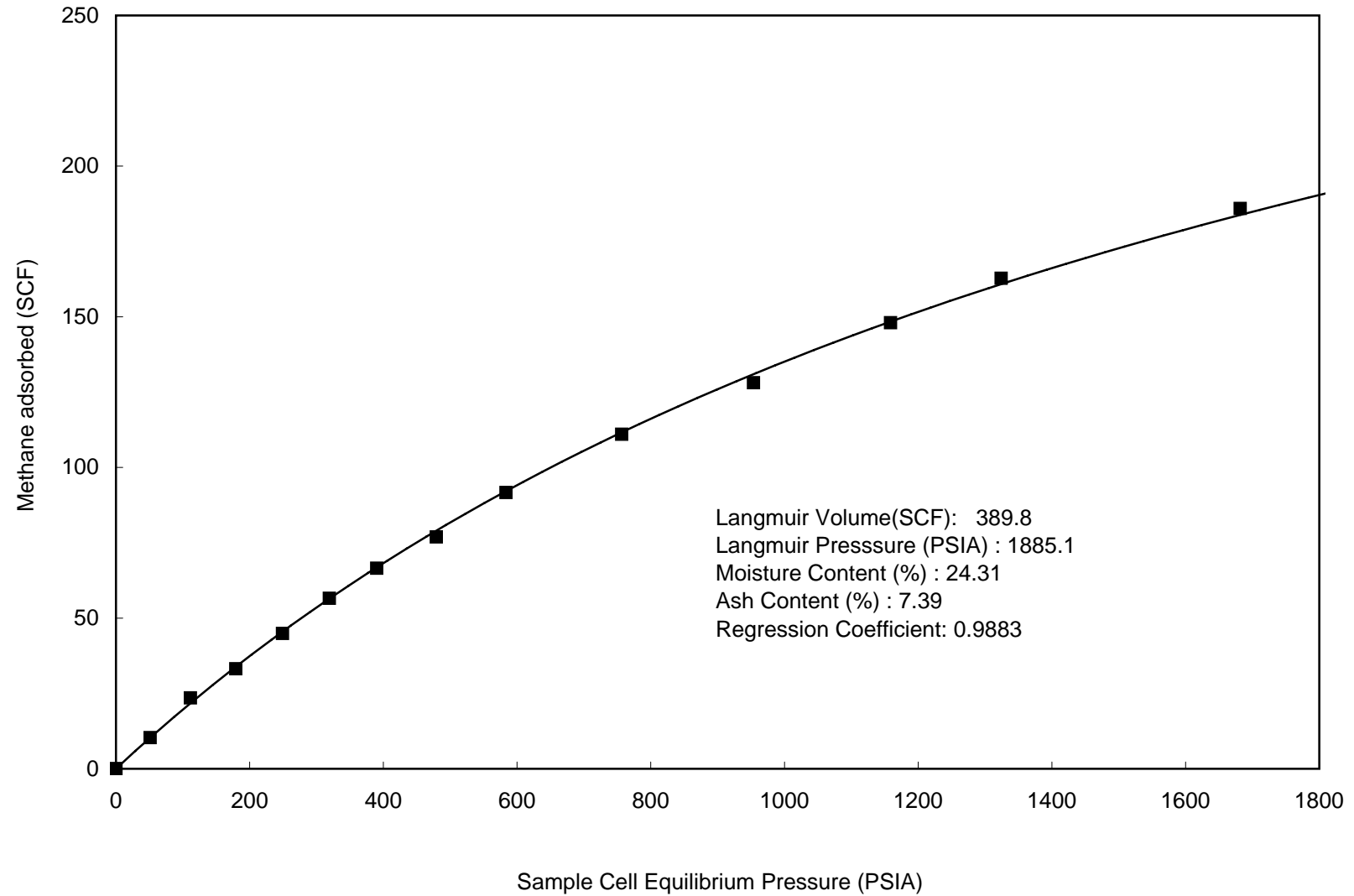
51	8	6.70
111	17	6.42
179	24	7.32
249	33	7.53
319	42	7.65
390	49	7.95
479	57	8.45
583	68	8.63
756	82	9.24
954	94	10.09
1159	109	10.61
1324	120	11.03
1682	137	12.26

Saturated Monolayer Volume (SCF/ton):	288
Langmuir Pressure (PSIA):	1885
Correlation Coefficient:	0.9883

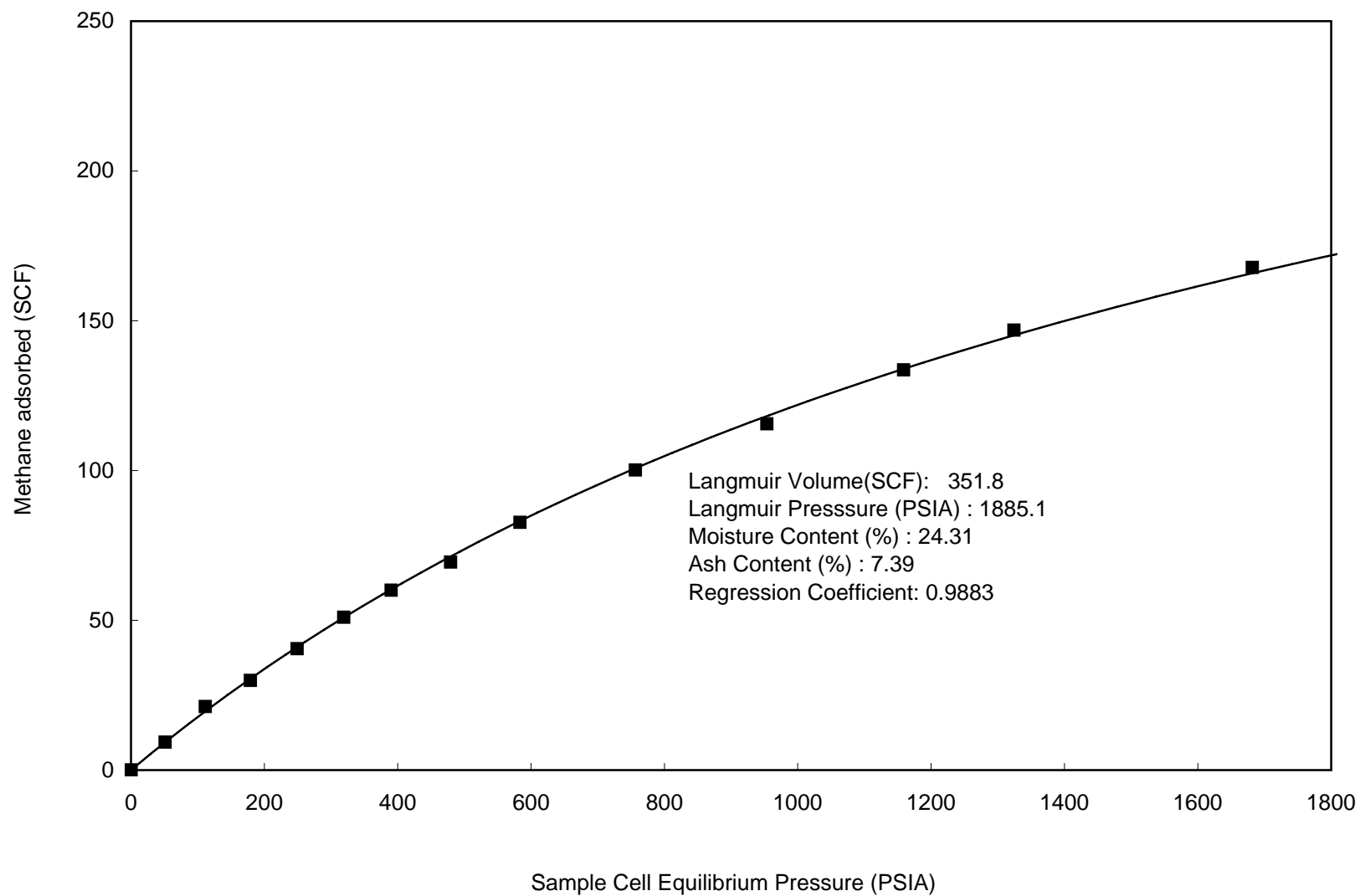
### 9-1A Methane (as received basis)



### 9-1A Methane (dry & ash free basis)

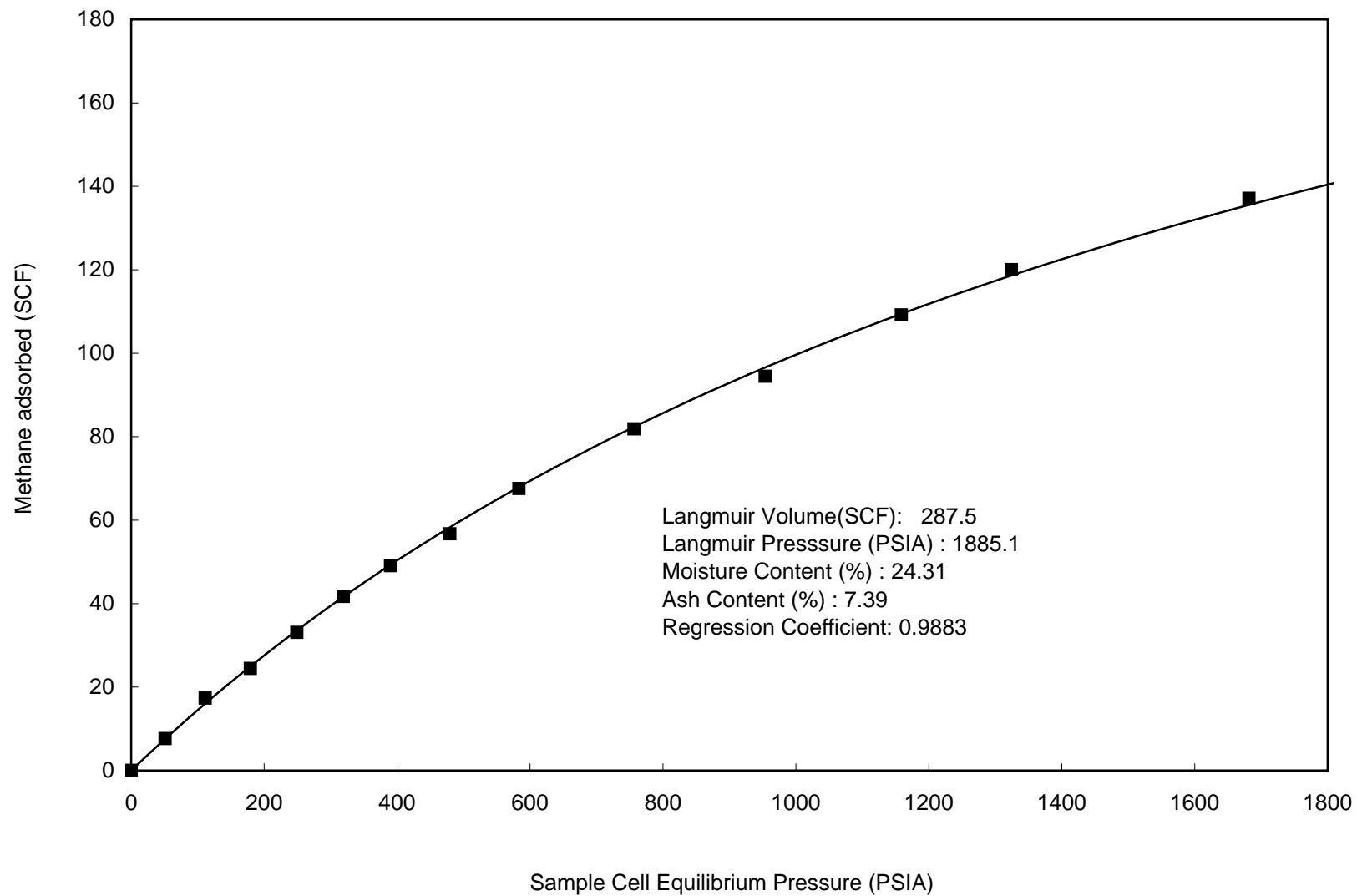


### 9-1A Methane (moisture free, ash included basis)

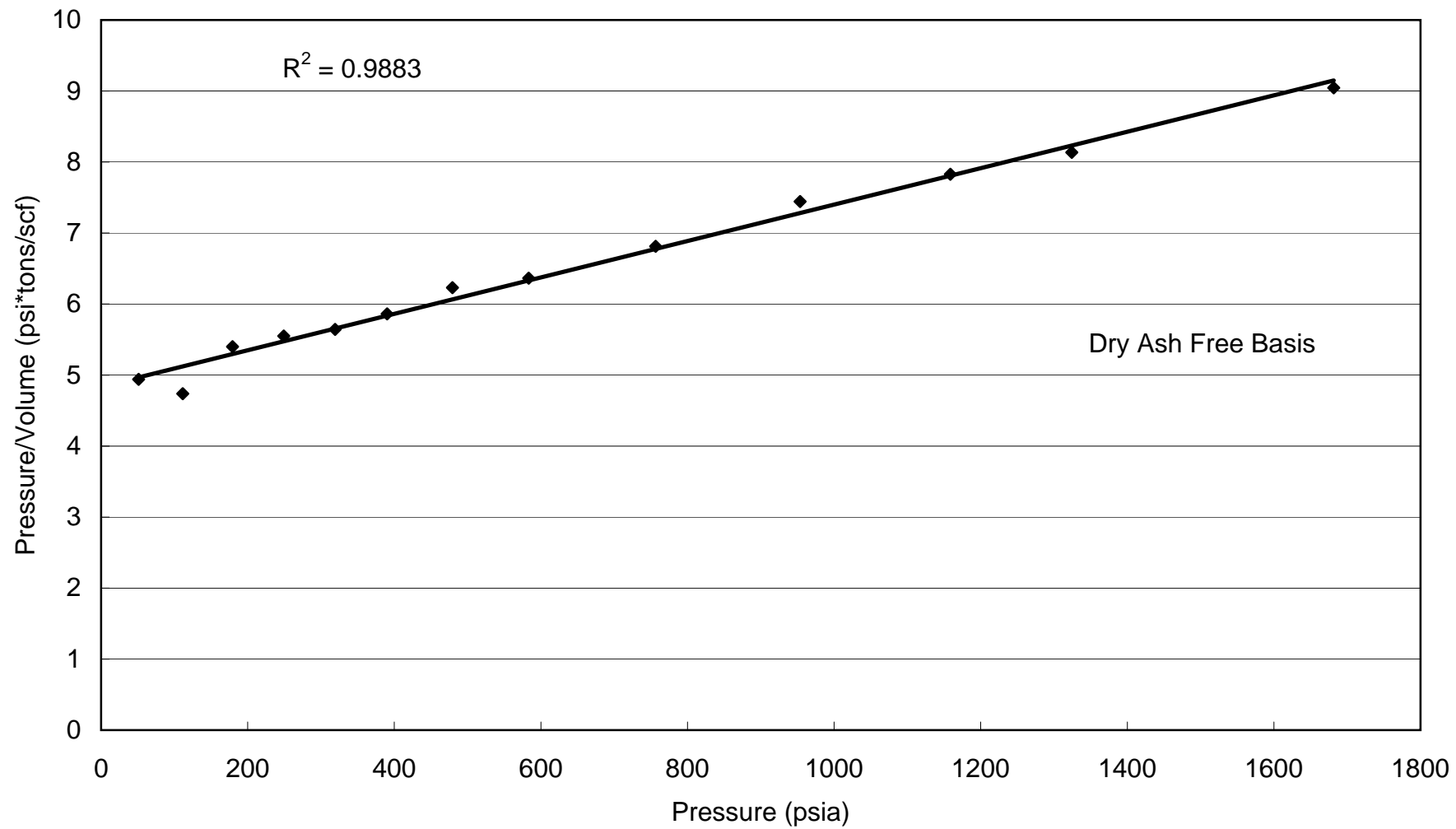




### 9-1A Methane (ash free, moisture included basis)



## Adsorption Langmuir Plot



## 9-1A Methane

### Methane Adsorption (SI Units)

#### ***Summary of Analyses***

	As Received	DAF basis
Langmuir Volume cc/g	7.83	11.46
Langmuir Pressure MPa	13.00	13.00
Goodness of fit Langmuir Equation R-squared	0.99	0.99
Ash Content Wt.%	7.39	7.39
Equilibrium Moisture Wt.%	24.31	24.31

#### **Contents of Appendix**

##### ***data sheets***

As Received  
Dry Ash Free  
Dry Ash Included  
Moist Ash Free

##### ***Charts***

As Received  
Dry Ash Free  
Dry Ash Included  
Moist Ash Free

## 9-1A Methane

### GAS ADSORPTION ISOTHERM SI UNITS

#### AS RECEIVED BASIS

Sample I.D. :	9-1A Methane	Moisture Content (EQ) % :	24.31
Isotherm Temperature ° C:	36.1	Ash Content % :	7.39
Gas used:	Methane	Helium Density g/cc	1.308

PRESSURE (MPa)	ADSORBED GAS (cc/g @STP)	P / V
0.353	0.21	1.697
0.768	0.47	1.627
1.236	0.67	1.855
1.718	0.90	1.907
2.201	1.14	1.938
2.690	1.34	2.013
3.305	1.54	2.140
4.022	1.84	2.186
5.216	2.23	2.340
6.575	2.57	2.557
7.989	2.97	2.688
9.130	3.27	2.794
11.595	3.73	3.107

Saturated Monolayer Volume (cc/g @ STP):	7.83
Langmuir Pressure (MPa):	13.00

#### DRY ASH FREE BASIS

0.353	0.30	1.159
0.768	0.69	1.111
1.236	0.98	1.267
1.718	1.32	1.302
2.201	1.66	1.324
2.690	1.96	1.375
3.305	2.26	1.462
4.022	2.69	1.493
5.216	3.26	1.598
6.575	3.77	1.746
7.989	4.35	1.836
9.130	4.78	1.909
11.595	5.46	2.122

Saturated Monolayer Volume (cc/g @ STP, daf):	11.46
Langmuir Pressure (MPa):	13.00
Correlation Coefficient:	0.9883

## 9-1A Methane

### GAS ADSORPTION ISOTHERM SI UNITS

#### MOISTURE FREE ASH INCLUDED

Isotherm Temperature ° C:	36.1	Moisture Content (EQ) % :	24.31
Gas used:	Methane	Ash Content % :	7.39
		Helium Density g/cc	1.308

PRESSURE (MPa)	ADSORBED GAS (cc/g@STP)	P / V
0.353	0.27	1.28
0.768	0.62	1.23
1.236	0.88	1.40
1.718	1.19	1.44
2.201	1.50	1.47
2.690	1.77	1.52
3.305	2.04	1.62
4.022	2.43	1.65
5.216	2.94	1.77
6.575	3.40	1.94
7.989	3.93	2.03
9.130	4.32	2.12
11.595	4.93	2.35

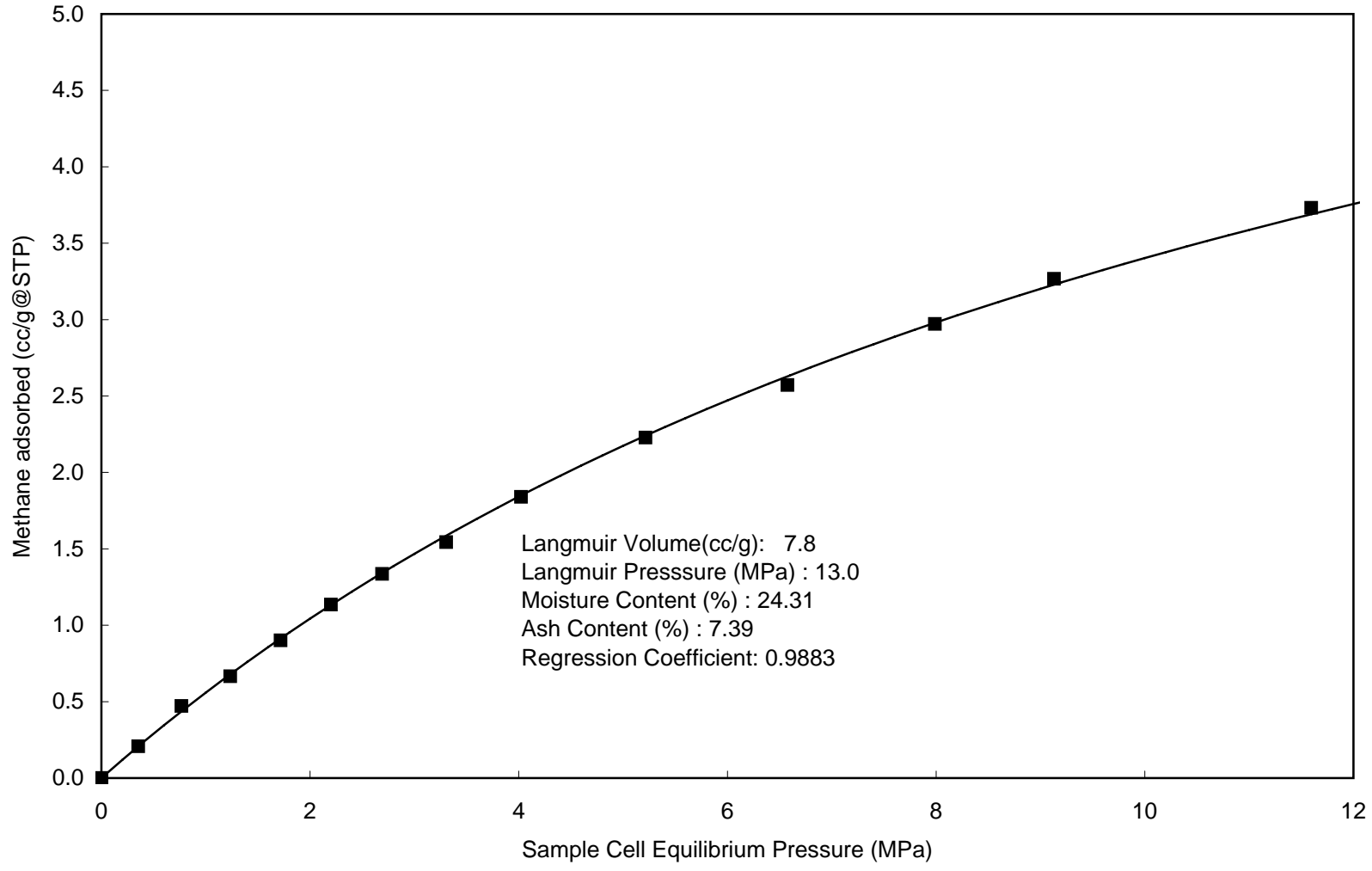
Saturated Monolayer Volume (cc/g):	10.34
Langmuir Pressure (MPa):	13.00

#### ASH FREE MOISTURE INCLUDED

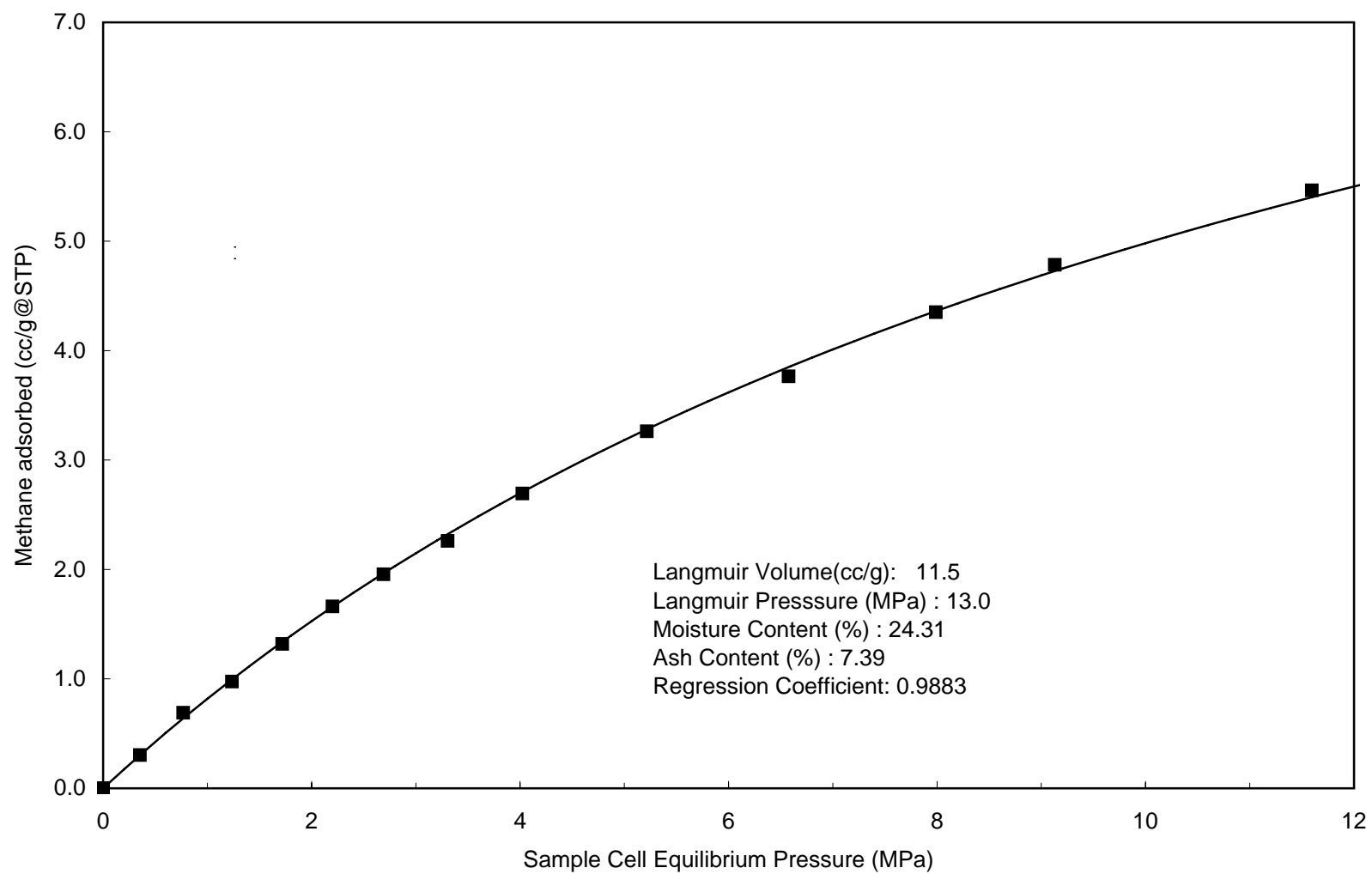
0.353	0.22	0.00
0.768	0.51	1.51
1.236	0.72	1.72
1.718	0.97	1.77
2.201	1.23	1.80
2.690	1.44	1.86
3.305	1.67	1.98
4.022	1.99	2.02
5.216	2.41	2.17
6.575	2.78	2.37
7.989	3.21	2.49
9.130	3.53	2.59
11.595	4.03	2.88

Saturated Monolayer Volume (cc/g, ash free):	8.45
Langmuir Pressure (MPa):	13.00
Correlation Coefficient:	0.9883

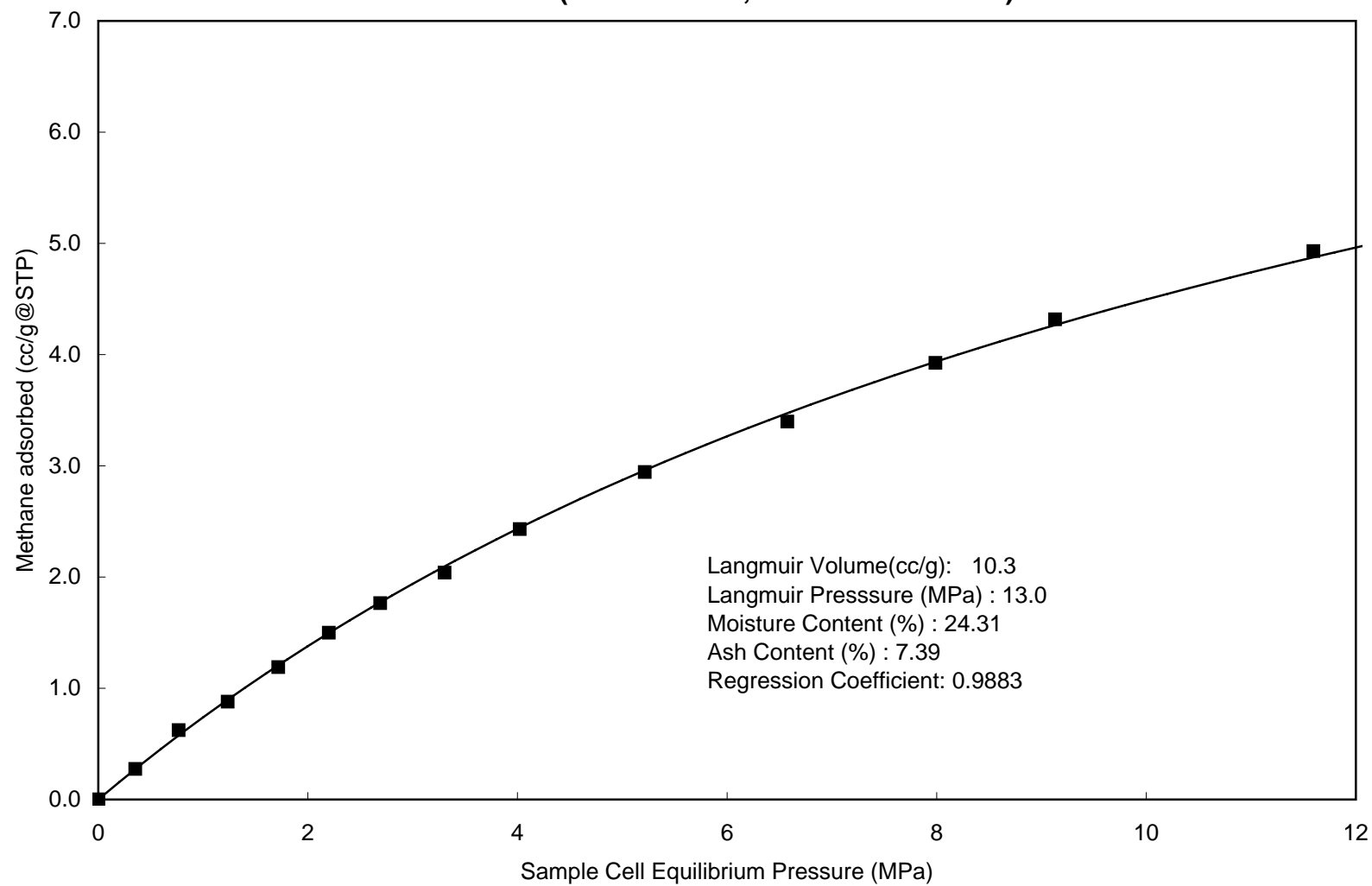
9-1A Methane (as received basis)



### 9-1A Methane (dry & ash free basis)

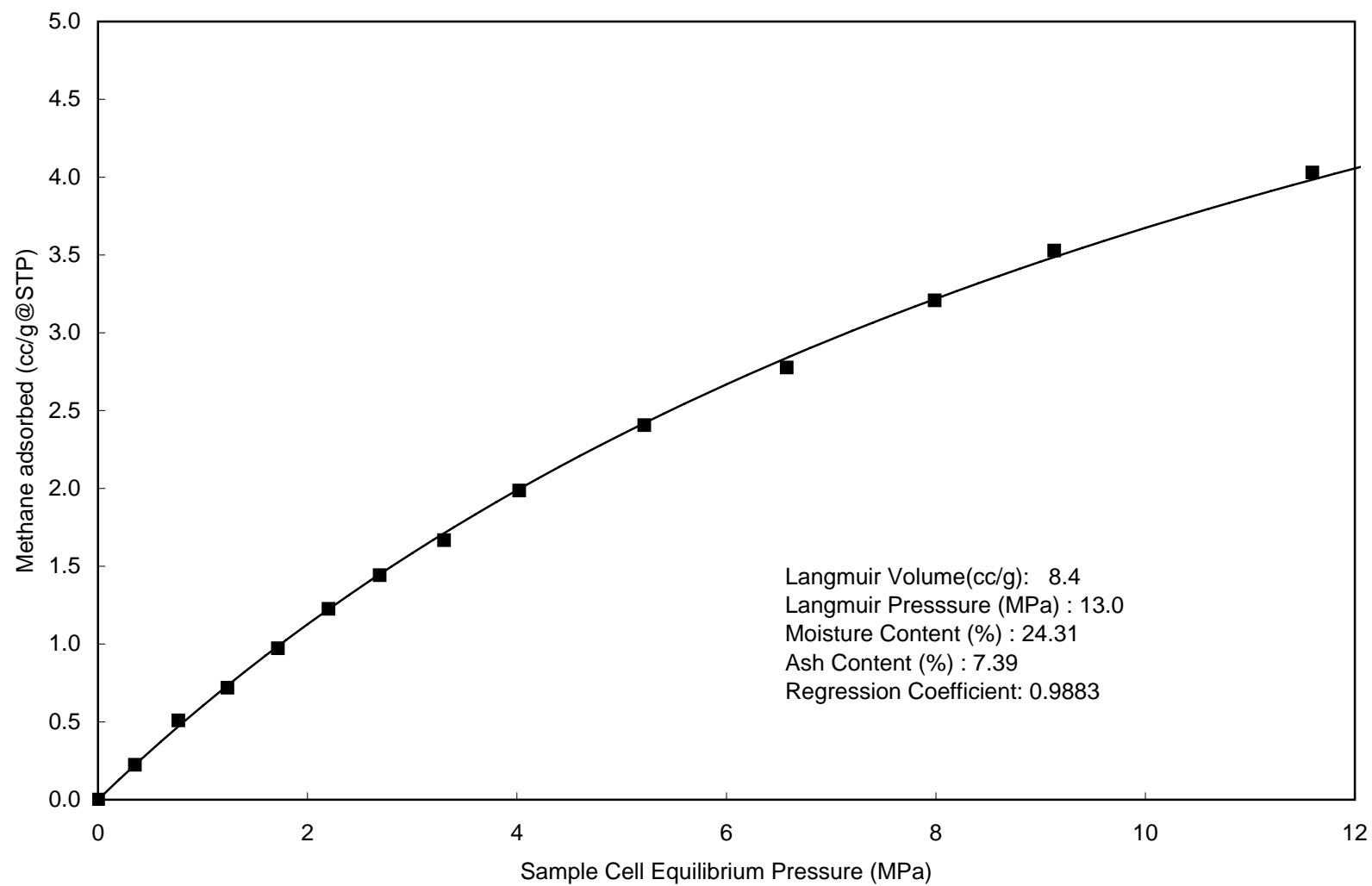


### 9-1A Methane (moisture free, ash included basis)





### 9-1A Methane (ash free, moisture included basis)



## Adsorption Langmuir Plot

