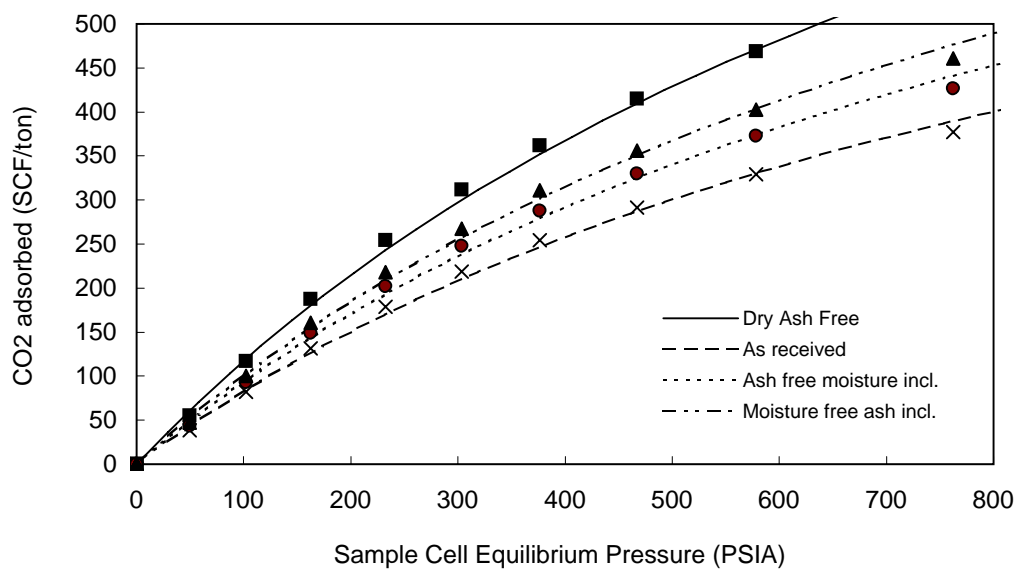


## 5-1C Carbon Dioxide



Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)			
	As Received	moisture free ash incl.	ash free moisture incl.	Dry Ash Free
49	38.6	47.2	43.7	55.0
102	81.9	100.1	92.7	116.7
163	131.4	160.6	148.7	187.2
232	178.5	218.1	202.0	254.3
304	219.0	267.6	247.8	312.0
377	254.2	310.7	287.7	362.2
467	291.5	356.2	329.9	415.3
578	329.2	402.3	372.5	469.0
762	376.9	460.6	426.6	537.0

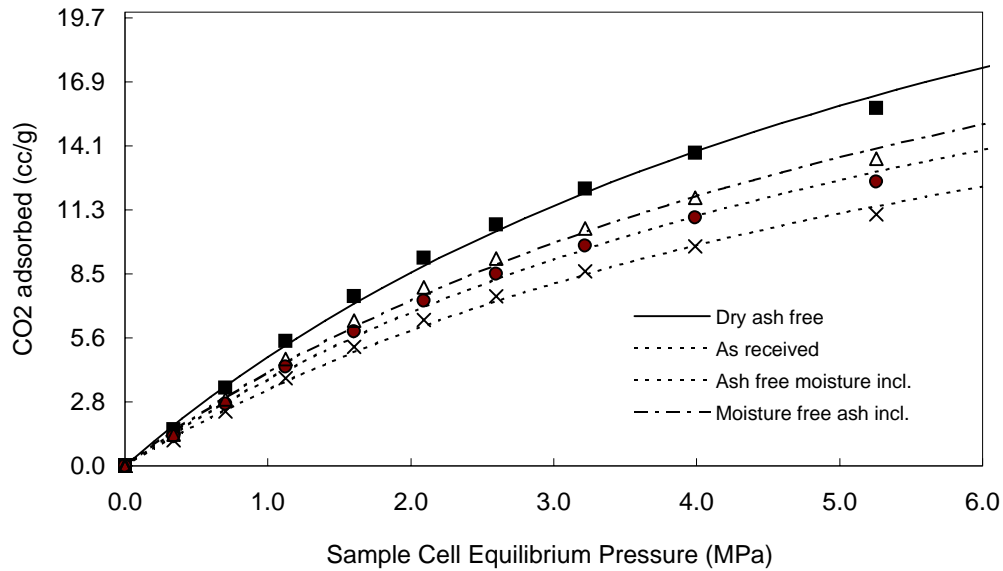
### Langmuir Parameters

	As Received	Moisture free ash incl	Ash free moisture incl	Dry Ash Free
Vol. (ft <sup>3</sup> /ton)	893.9	1092.4	1011.7	1273.6
Pressure (PSIA)	985.3	985.3	985.3	985.3

### SUMMARY OF ADSORPTION ANALYSES IMP. UNITS

Isotherm Temperature: 118.4 °F  
 Goodness of fit of Langmuir regression: 0.95  
 % Ash= 11.64      % Moisture= 18.17      Density g/cc 1.375

## 5-1C Carbon Dioxide



Pressure (MPa)	Adsorbed gas (cc/g)			
	As Received	Moisture free ash incl.	ash free moisture incl	Dry Ash Free
0.341	1.13	1.39	1.28	1.62
0.703	2.41	2.94	2.73	3.43
1.122	3.86	4.72	4.37	5.50
1.602	5.25	6.41	5.94	7.47
2.093	6.44	7.86	7.28	9.17
2.597	7.47	9.13	8.46	10.65
3.221	8.57	10.47	9.69	12.20
3.988	9.67	11.82	10.95	13.78
5.255	11.08	13.54	12.54	15.78

### Langmuir Parameters

	As Received	Moisture free ash incl.	Ash free moisture incl	Dry Ash Free
Vol. (cc/g)	26.27	32.10	29.73	37.43
Pressure (MPa)	6.79	6.79	6.79	6.79

### SUMMARY OF ADSORPTION ANALYSES SI UNITS

Isotherm Temperature:

48.0 °C

Goodness of fit of Langmuir regression:

0.95

% Ash= 11.64

% Moisture =

18.17

Density (g/cc)

**1.375**

## 5-1C Carbon Dioxide

### CO<sub>2</sub> Adsorption (Imperial Units)

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

	As Received	DAF basis
Langmuir Volume (SCF)	894	1274
Langmuir Pressure (PSIA)	985	985
Goodness of fit Langmuir		
Equation R-squared	0.95	0.95
Ash Content Wt.%	11.64	11.64
Equilibrium Moisture Wt.%	18.17	18.17

#### **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

**5-1C Carbon Dioxide**  
**GAS ADSORPTION ISOTHERM IMPERIAL UNITS**

**AS RECEIVED BASIS**

Isotherm Temperature ° F:	118.4	Moisture Content % :	18.17
Gas used:	CO2	Ash Content, % :	11.64
		Helium Density g/cc	1.375

PRESSURE (PSI)	ADSORBED GAS (SCF/ton)	P / V
49	38.59	1.28
102	81.94	1.24
163	131.43	1.24
232	178.51	1.30
304	218.99	1.39
377	254.24	1.48
467	291.48	1.60
578	329.18	1.76
762	376.94	2.02

Saturated Monolayer Volume (SCF/ton):	893.9
Langmuir Pressure (PSIA):	985.3
Correlation Coefficient:	0.9454

**DRY ASH FREE BASIS**

49	54.98	0.90
102	116.74	0.87
163	187.25	0.87
232	254.32	0.91
304	311.99	0.97
377	362.21	1.04
467	415.27	1.12
578	468.98	1.23
762	537.03	1.42

Saturated Monolayer Volume (SCF/ton, daf):	1274
Langmuir Pressure (PSIA):	985
Correlation Coefficient:	0.9454

# **5-1C Carbon Dioxide** **GAS ADSORPTION ISOTHERM IMPERIAL UNITS**

## **MOISTURE FREE ASH INCLUDED**

Isotherm Temperature° F:	118.4	Moisture Content % :	18.17
Gas used:	CO2	Ash Content, % :	11.64
		Helium Density g/cc	1.375

PRESSURE (PSI)	ADSORBED GAS (SCF/ton)	P / V
49	47	1.05
102	100	1.02
163	161	1.01
232	218	1.07
304	268	1.13
377	311	1.21
467	356	1.31
578	402	1.44
762	461	1.65

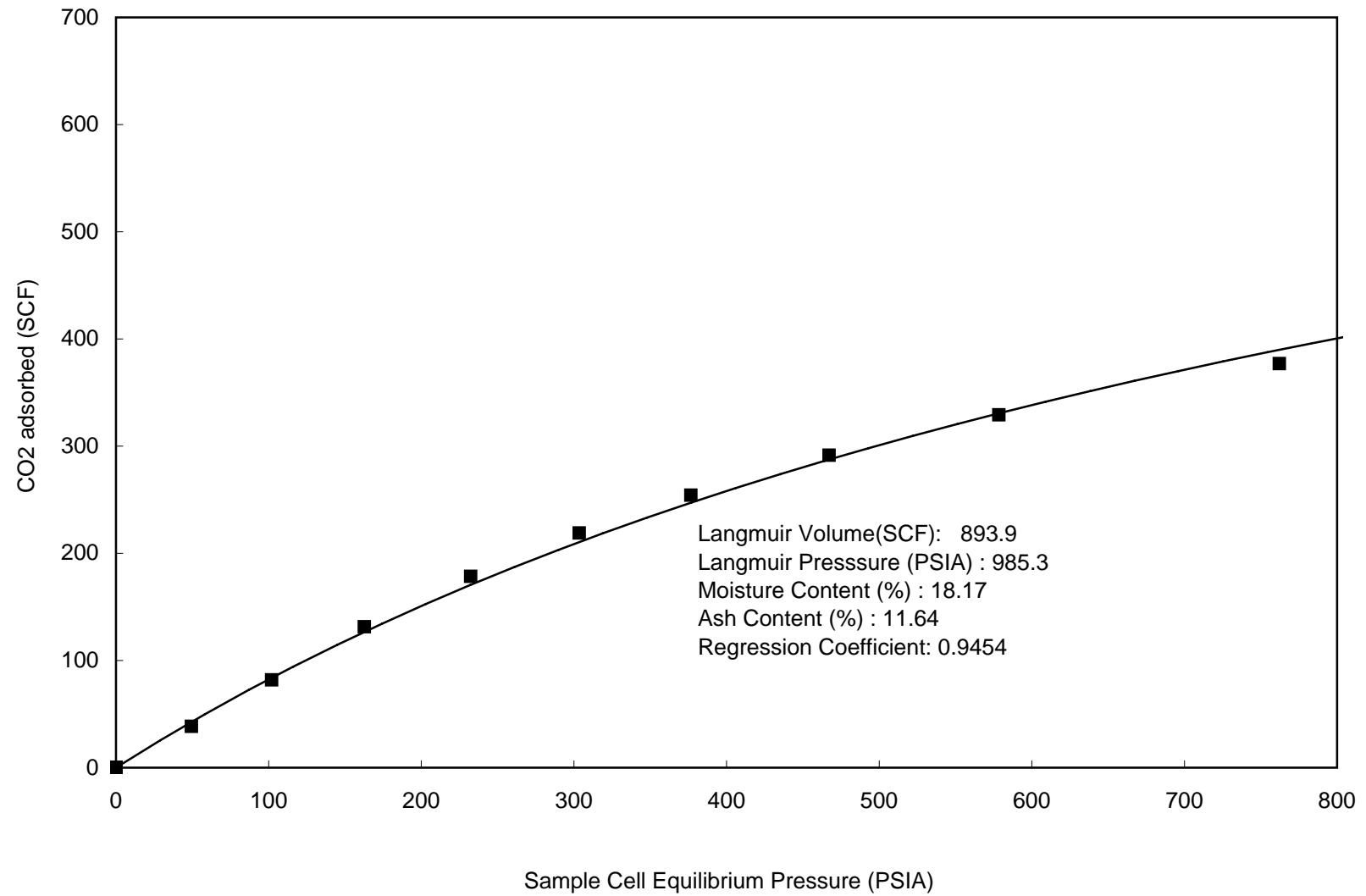
Saturated Monolayer Volume (SCF/ton):	1092
Langmuir Pressure (PSIA):	985
Correlation Coefficient:	0.9454

## **ASH FREE MOISTURE INCLUDED**

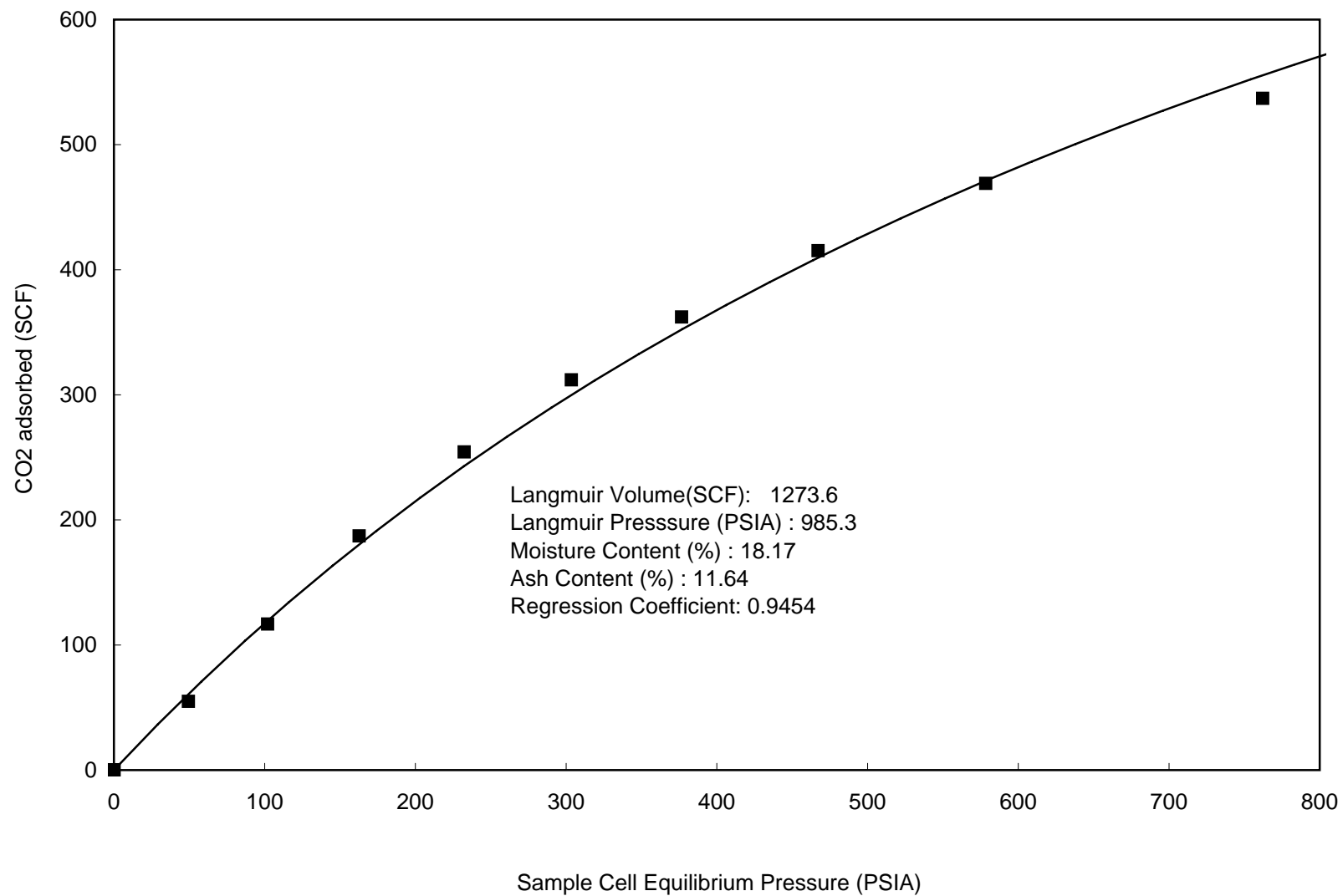
49	44	1.13
102	93	1.10
163	149	1.09
232	202	1.15
304	248	1.22
377	288	1.31
467	330	1.42
578	373	1.55
762	427	1.79

Saturated Monolayer Volume (SCF/ton):	1012
Langmuir Pressure (PSIA):	985
Correlation Coefficient:	0.9454

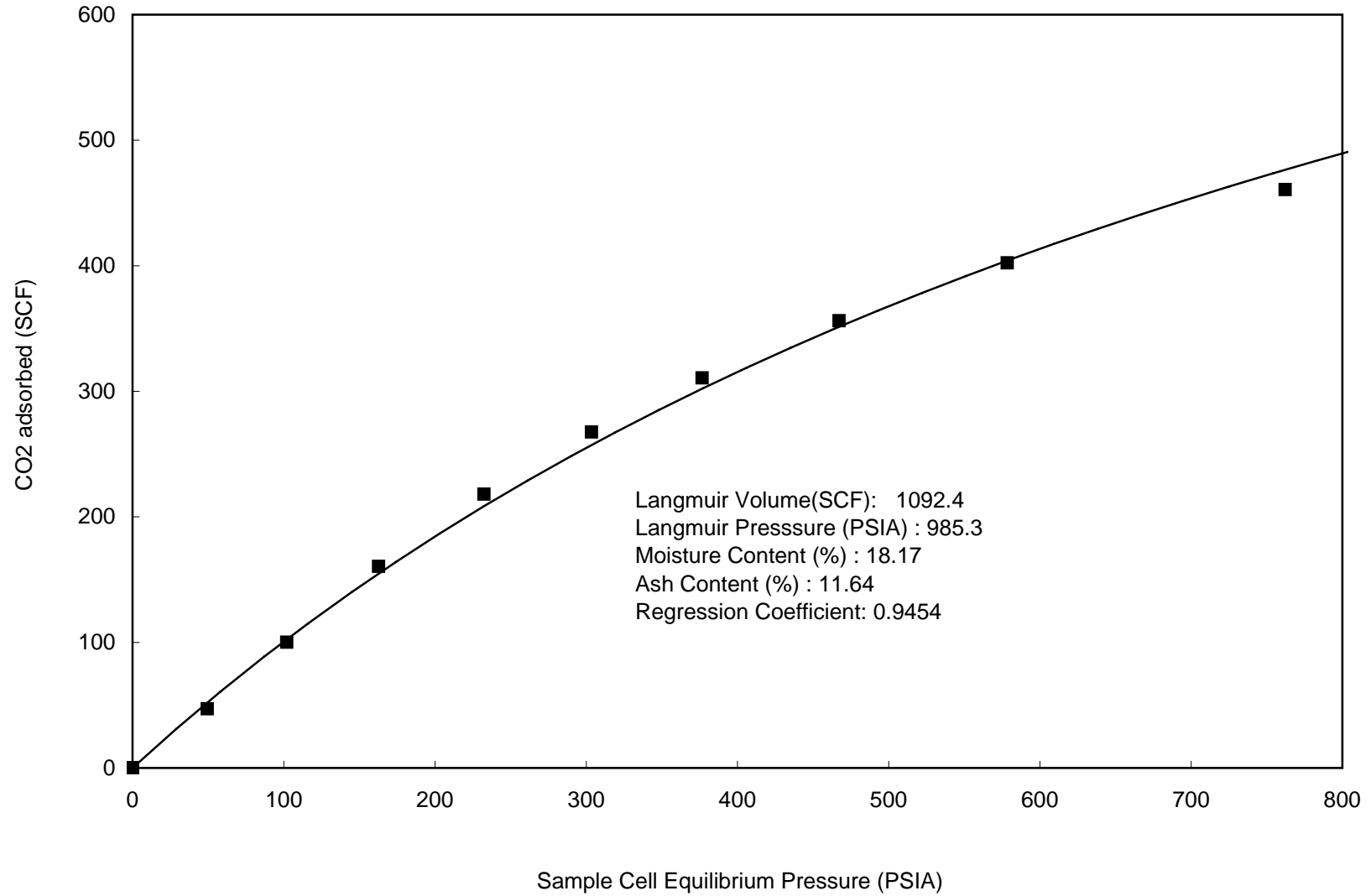
### 5-1C Carbon Dioxide (as received basis)



### 5-1C Carbon Dioxide (dry & ash free basis)

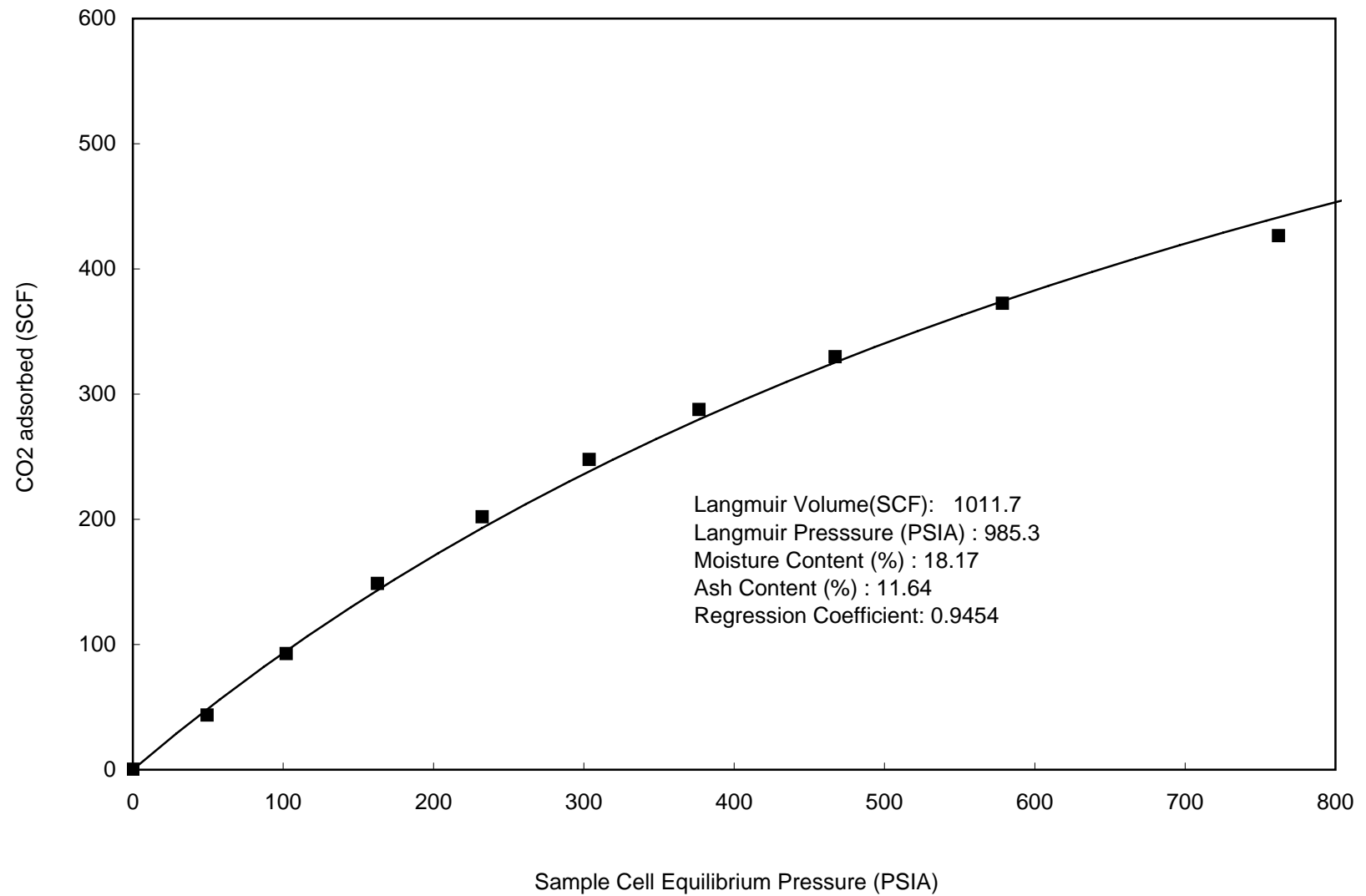


### 5-1C Carbon Dioxide (moisture free, ash included basis)

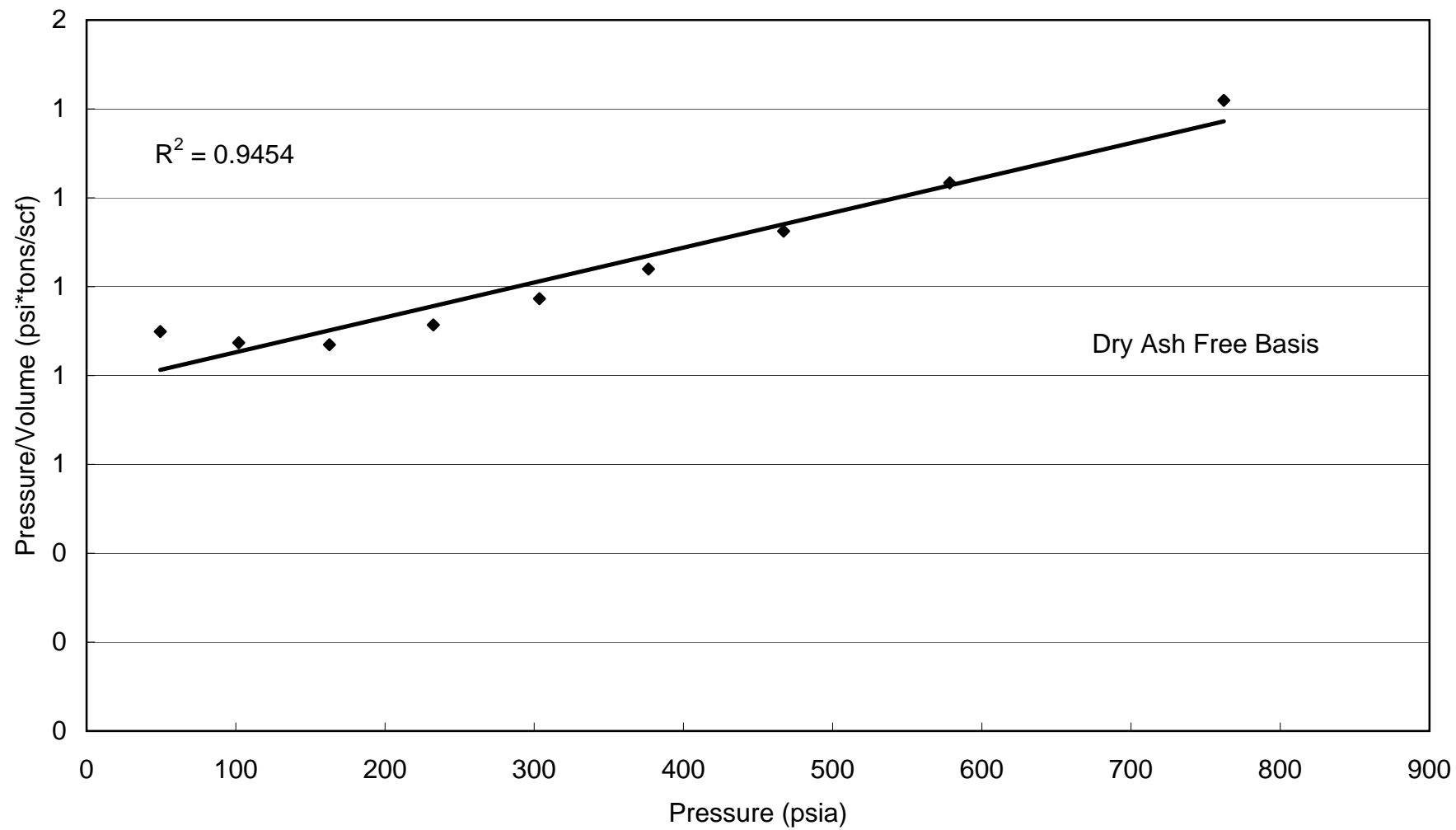




### 5-1C Carbon Dioxide (ash free, moisture included basis)



## Adsorption Langmuir Plot



## 5-1C Carbon Dioxide

### CO<sub>2</sub> Adsorption (SI Units)

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

	As Received	DAF basis
Langmuir Volume cc/g	26.27	37.43
Langmuir Pressure MPa	6.79	6.79
Goodness of fit Langmuir		
Equation R-squared	0.95	0.95
Ash Content Wt.%	11.64	11.64
Equilibrium Moisture Wt.%	18.17	18.17

#### **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

**5-1C Carbon Dioxide**  
**GAS ADSORPTION ISOTHERM SI UNITS**

**AS RECEIVED BASIS**

Sample I.D. : 5-1C Carbon Dioxide Moisture Content (EQ) % : 18.17

Isotherm Temperature ° C: 48 Ash Content % : 11.64

Gas used: CO2 Helium Density g/cc 1.375

PRESSURE (MPa)	ADSORBED GAS (cc/g @STP)	P / V
0.341	1.13	0.300
0.703	2.41	0.292
1.122	3.86	0.291
1.602	5.25	0.305
2.093	6.44	0.325
2.597	7.47	0.348
3.221	8.57	0.376
3.988	9.67	0.412
5.255	11.08	0.474

Saturated Monolayer Volume (cc/g @ STP): 26.27

Langmuir Pressure (MPa): 6.79

**DRY ASH FREE BASIS**

0.341	1.62	0.211
0.703	3.43	0.205
1.122	5.50	0.204
1.602	7.47	0.214
2.093	9.17	0.228
2.597	10.65	0.244
3.221	12.20	0.264
3.988	13.78	0.289
5.255	15.78	0.333

Saturated Monolayer Volume (cc/g @ STP, daf): 37.43

Langmuir Pressure (MPa): 6.79

Correlation Coefficient: 0.9454

## 5-1C Carbon Dioxide

### GAS ADSORPTION ISOTHERM SI UNITS

#### MOISTURE FREE ASH INCLUDED

Isotherm Temperature ° C:	48	Moisture Content (EQ) % :	18.17
Gas used:	CO2	Ash Content % :	11.64
		Helium Density g/cc	1.375

PRESSURE (MPa)	ADSORBED GAS (cc/g@STP)	P / V
0.341	1.39	0.25
0.703	2.94	0.24
1.122	4.72	0.24
1.602	6.41	0.25
2.093	7.86	0.27
2.597	9.13	0.28
3.221	10.47	0.31
3.988	11.82	0.34
5.255	13.54	0.39

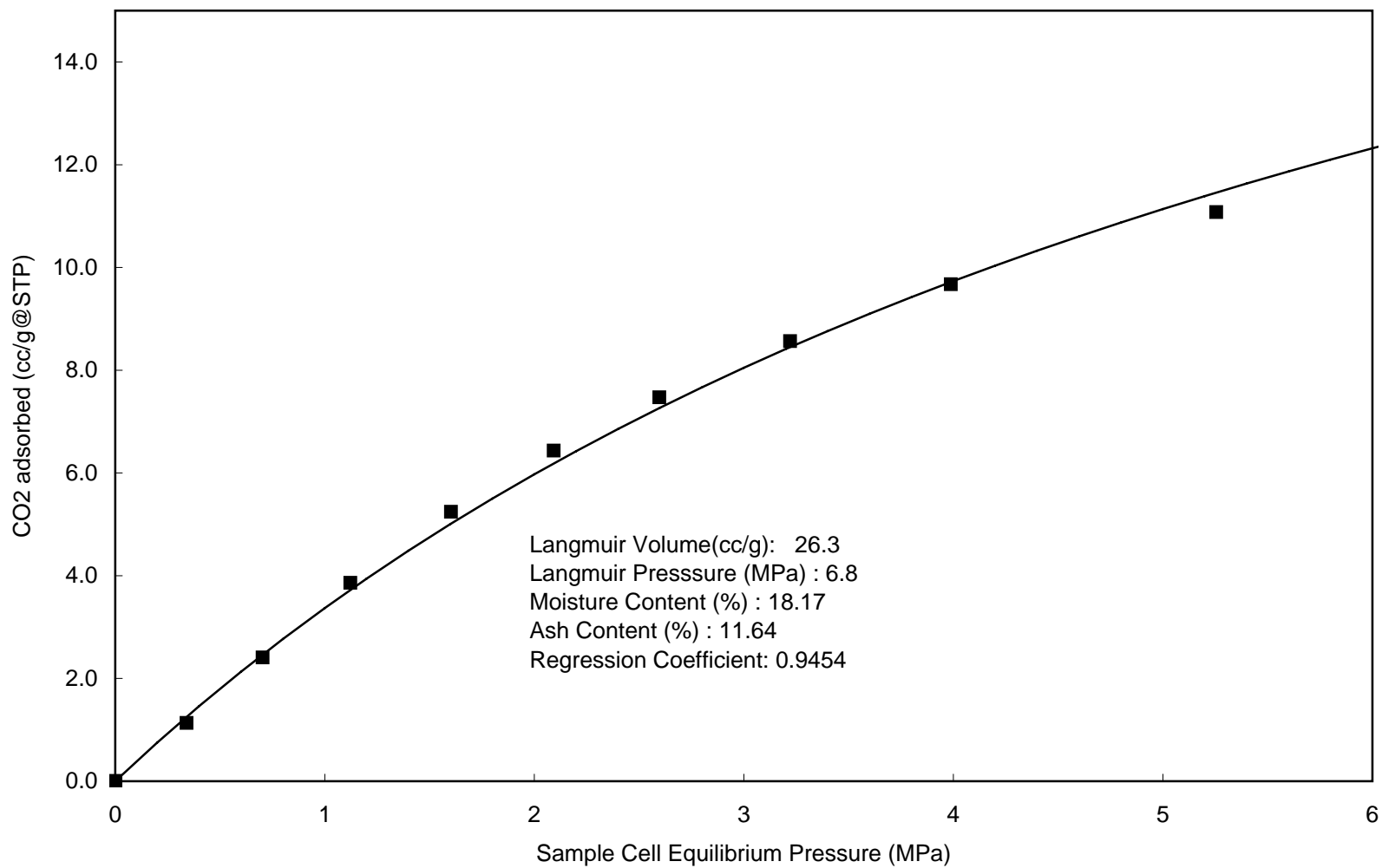
Saturated Monolayer Volume (cc/g):	32.10
Langmuir Pressure (MPa):	6.79

#### ASH FREE MOISTURE INCLUDED

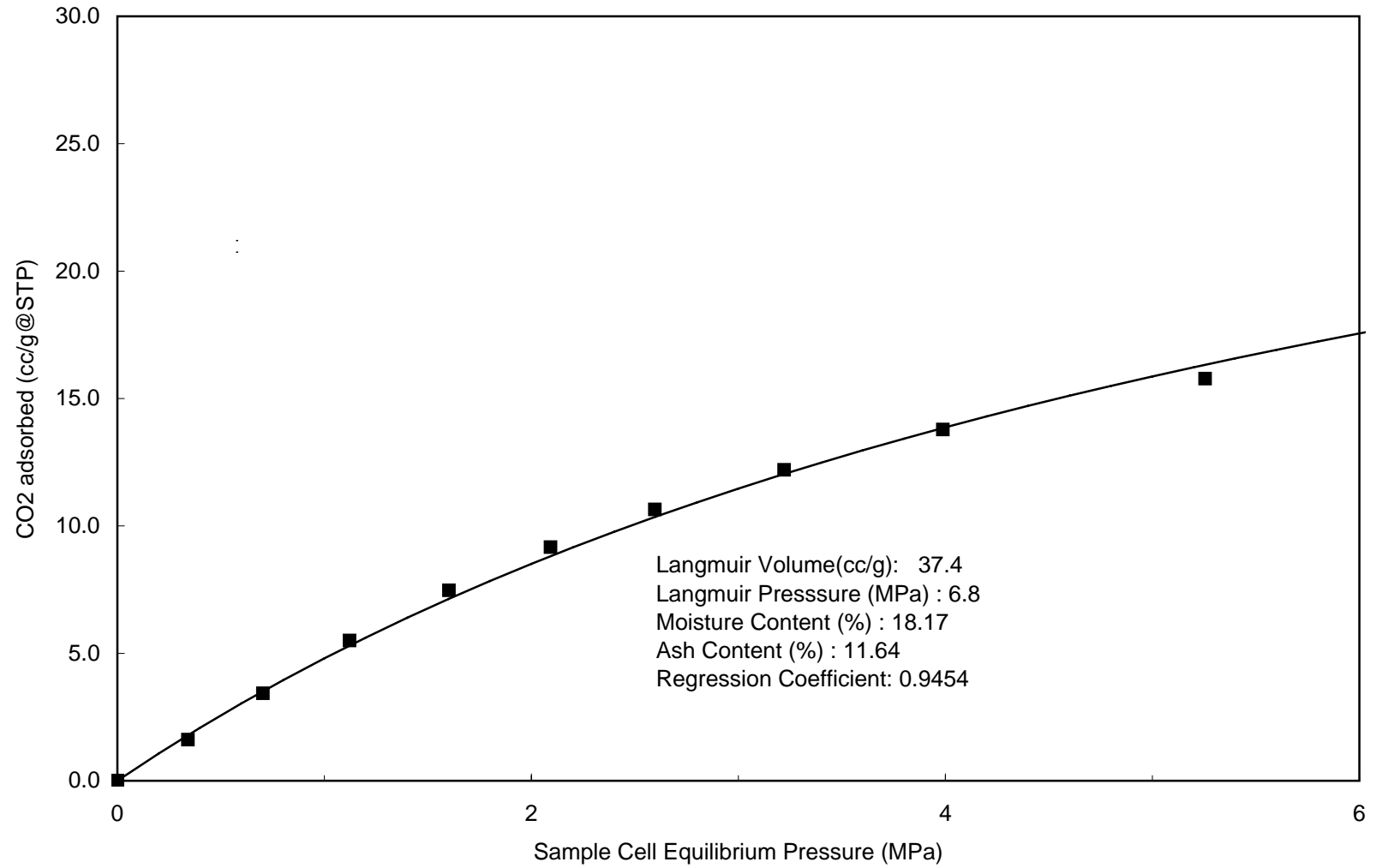
0.341	1.28	0.00
0.703	2.73	0.26
1.122	4.37	0.26
1.602	5.94	0.27
2.093	7.28	0.29
2.597	8.46	0.31
3.221	9.69	0.33
3.988	10.95	0.36
5.255	12.54	0.42

Saturated Monolayer Volume (cc/g, ash free):	29.73
Langmuir Pressure (MPa):	6.79
Correlation Coefficient:	0.9454

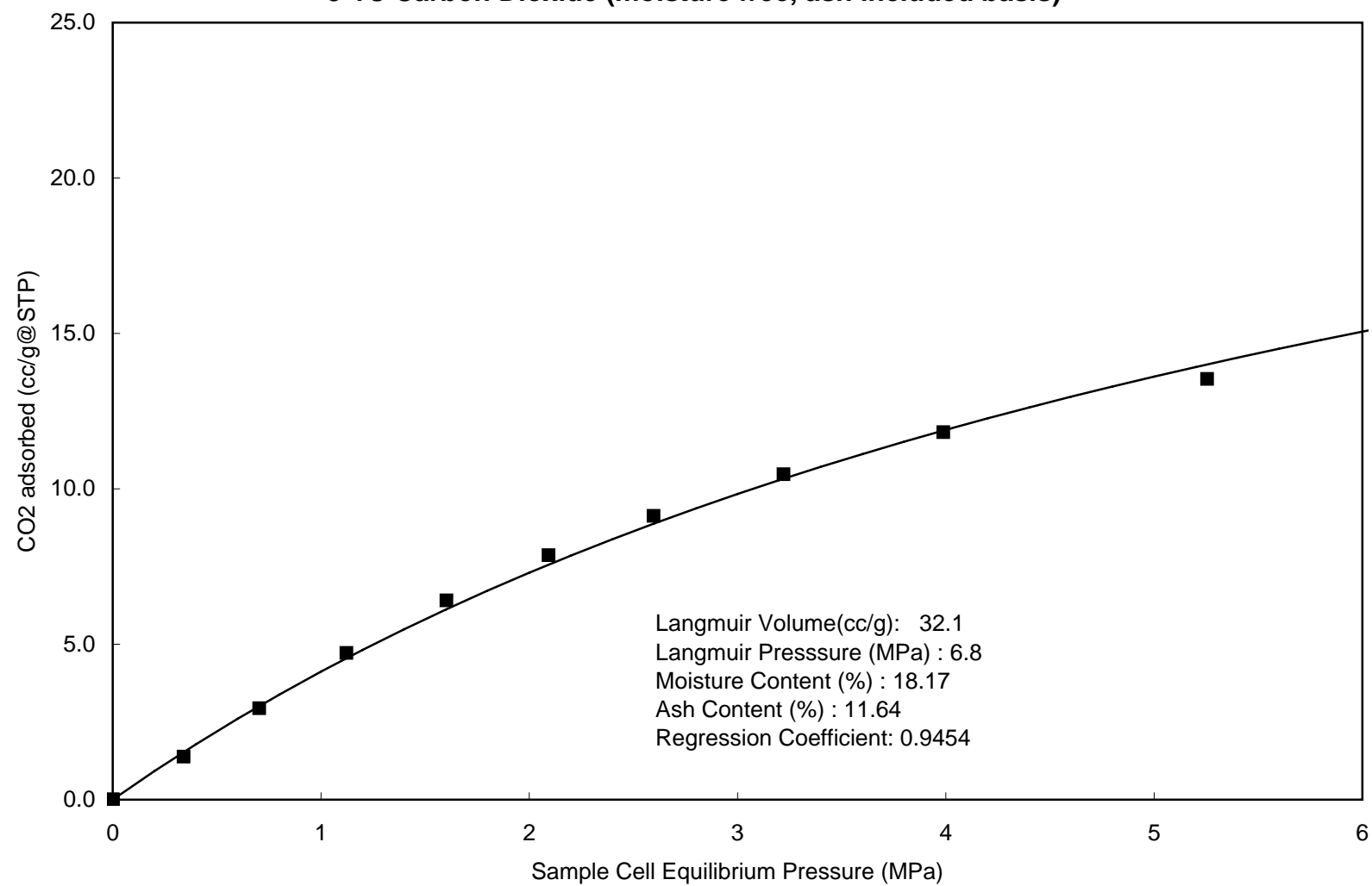
### 5-1C Carbon Dioxide (as received basis)



### 5-1C Carbon Dioxide (dry & ash free basis)

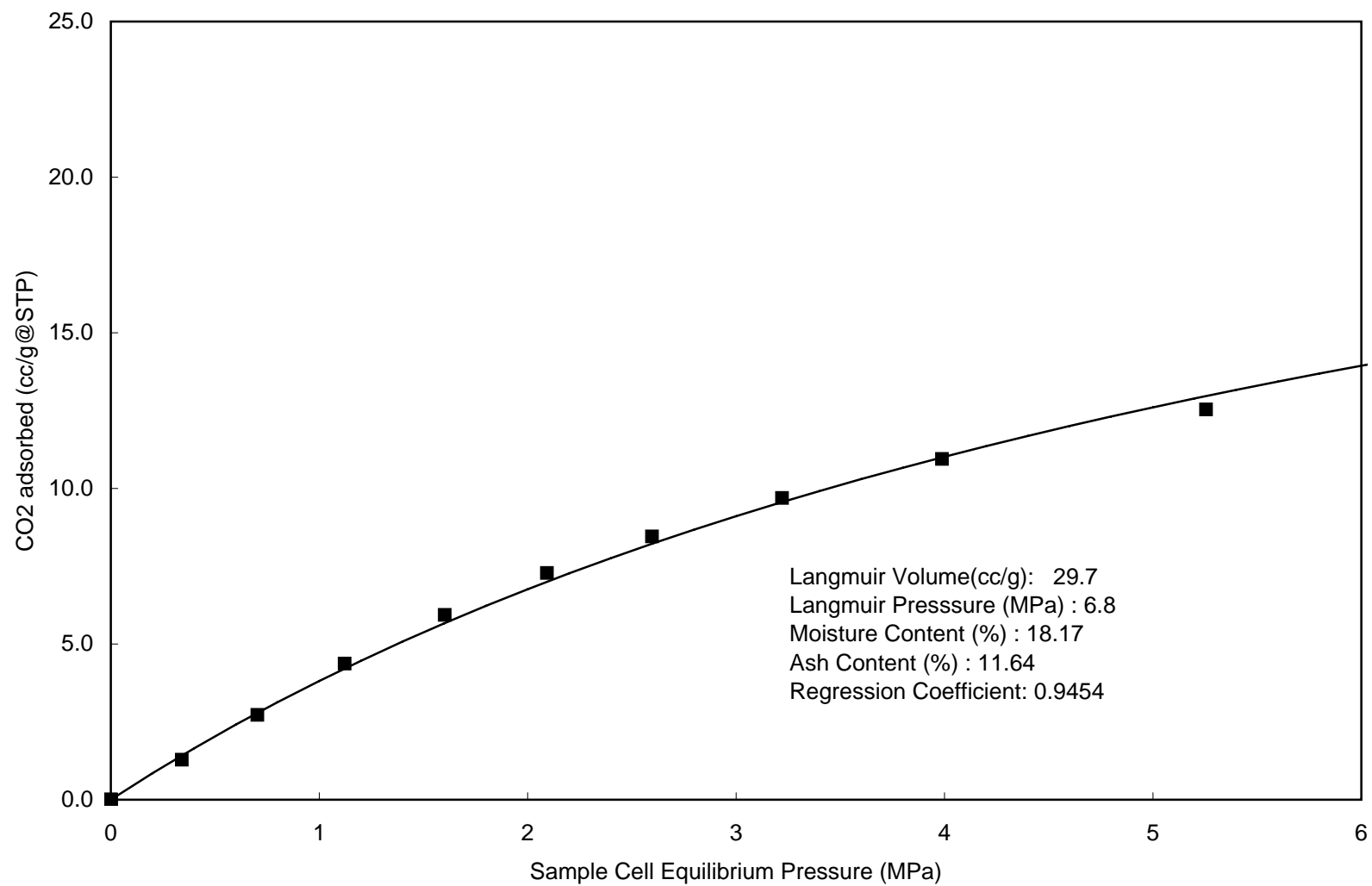


### 5-1C Carbon Dioxide (moisture free, ash included basis)





### 5-1C Carbon Dioxide (ash free, moisture included basis)



## Adsorption Langmuir Plot

