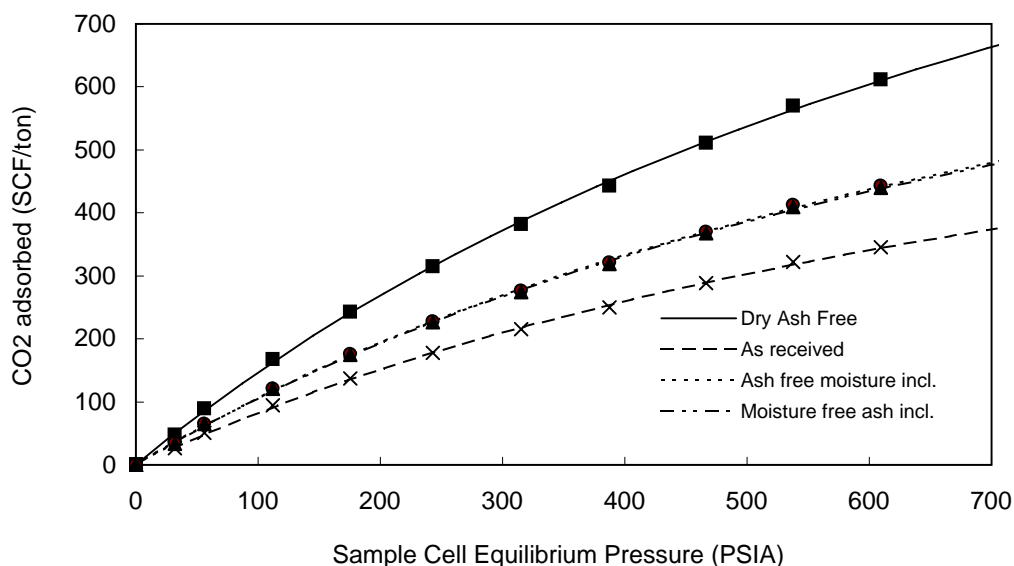


5-1A Carbon Dioxide



Pressure (PSIA)	Adsorbed gas (ft ³ /ton)			
	As Received	moisture free ash incl.	ash free moisture incl.	Dry Ash Free
32	26.7	34.0	34.3	47.3
56	50.7	64.6	65.0	89.9
112	94.5	120.4	121.2	167.4
175	137.1	174.6	175.8	242.9
243	177.7	226.4	228.0	314.9
315	215.3	274.3	276.2	381.5
388	250.2	318.8	321.0	443.4
467	288.4	367.4	369.9	511.0
538	321.6	409.8	412.6	569.9
609	345.3	440.0	443.0	612.0

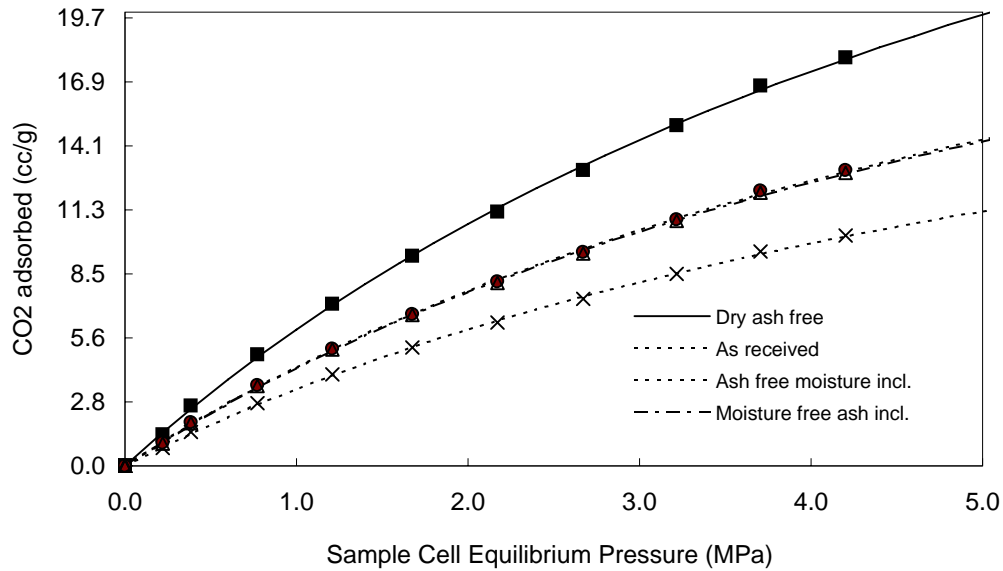
Langmuir Parameters

	As Received	Moisture free ash incl	Ash free moisture incl	Dry Ash Free
Vol. (ft ³ /ton)	901.4	1148.6	1156.4	1597.4
Pressure (PSIA)	986.4	986.4	986.4	986.4

SUMMARY OF ADSORPTION ANALYSES IMP. UNITS

Isotherm Temperature: 97.0 °F
 Goodness of fit of Langmuir regression: 0.98
 % Ash= 22.05 % Moisture= 21.52 Density g/cc 1.545

5-1A Carbon Dioxide



Pressure (MPa)	Adsorbed gas (cc/g)			
	As Received	Moisture free ash incl.	ash free moisture incl	Dry Ash Free
0.220	0.78	1.00	1.01	1.39
0.385	1.49	1.90	1.91	2.64
0.773	2.78	3.54	3.56	4.92
1.210	4.03	5.13	5.17	7.14
1.677	5.22	6.65	6.70	9.25
2.172	6.33	8.06	8.12	11.21
2.673	7.35	9.37	9.43	13.03
3.217	8.47	10.80	10.87	15.02
3.706	9.45	12.04	12.12	16.75
4.201	10.15	12.93	13.02	17.98

Langmuir Parameters

	As Received	Moisture free ash incl.	Ash free moisture incl	Dry Ash Free
Vol. (cc/g)	26.49	33.76	33.99	46.95
Pressure (MPa)	6.80	6.80	6.80	6.80

SUMMARY OF ADSORPTION ANALYSES SI UNITS

Isotherm Temperature:

36.1 °C

Goodness of fit of Langmuir regression:

0.98

% Ash= 22.05

% Moisture =

21.52

Density (g/cc)

1.545

5-1A Carbon Dioxide

CO₂ Adsorption (Imperial Units)

Summary of Analyses

	As Received	DAF basis
Langmuir Volume (SCF)	901	1597
Langmuir Pressure (PSIA)	986	986
Goodness of fit Langmuir		
Equation R-squared	0.98	0.98
Ash Content Wt.%	22.05	22.05
Equilibrium Moisture Wt.%	21.52	21.52

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

5-1A Carbon Dioxide
GAS ADSORPTION ISOTHERM IMPERIAL UNITS

AS RECEIVED BASIS

Isotherm Temperature ° F:	97.0	Moisture Content % :	21.52
Gas used:	CO2	Ash Content, % :	22.05
		Helium Density g/cc	1.545

PRESSURE (PSI)	ADSORBED GAS (SCF/ton)	P / V
32	26.71	1.19
56	50.70	1.10
112	94.49	1.19
175	137.07	1.28
243	177.69	1.37
315	215.28	1.46
388	250.20	1.55
467	288.37	1.62
538	321.59	1.67
609	345.32	1.76

Saturated Monolayer Volume (SCF/ton):	901.4
Langmuir Pressure (PSIA):	986.4
Correlation Coefficient:	0.9790

DRY ASH FREE BASIS

32	47.33	0.67
56	89.85	0.62
112	167.44	0.67
175	242.89	0.72
243	314.89	0.77
315	381.50	0.83
388	443.39	0.87
467	511.03	0.91
538	569.89	0.94
609	611.95	1.00

Saturated Monolayer Volume (SCF/ton, daf):	1597
Langmuir Pressure (PSIA):	986
Correlation Coefficient:	0.9790

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

MOISTURE FREE ASH INCLUDED

Isotherm Temperature° F:	97.0	Moisture Content % :	21.52
Gas used:	CO2	Ash Content, % :	22.05
		Helium Density g/cc	1.545

PRESSURE (PSI)	ADSORBED GAS (SCF/ton)	P / V
32	34	0.94
56	65	0.86
112	120	0.93
175	175	1.00
243	226	1.07
315	274	1.15
388	319	1.22
467	367	1.27
538	410	1.31
609	440	1.38

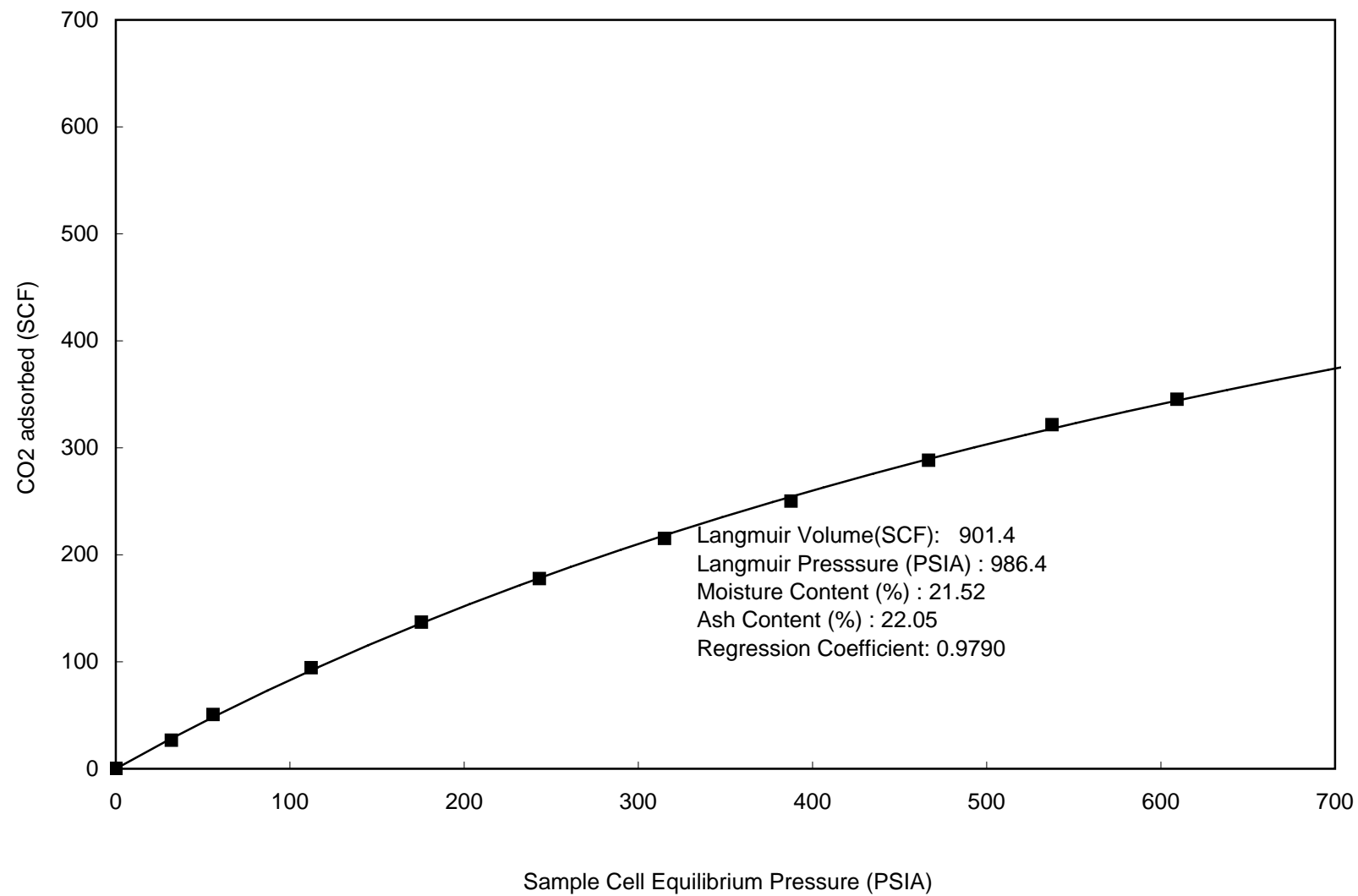
Saturated Monolayer Volume (SCF/ton):	1149
Langmuir Pressure (PSIA):	986
Correlation Coefficient:	0.9790

ASH FREE MOISTURE INCLUDED

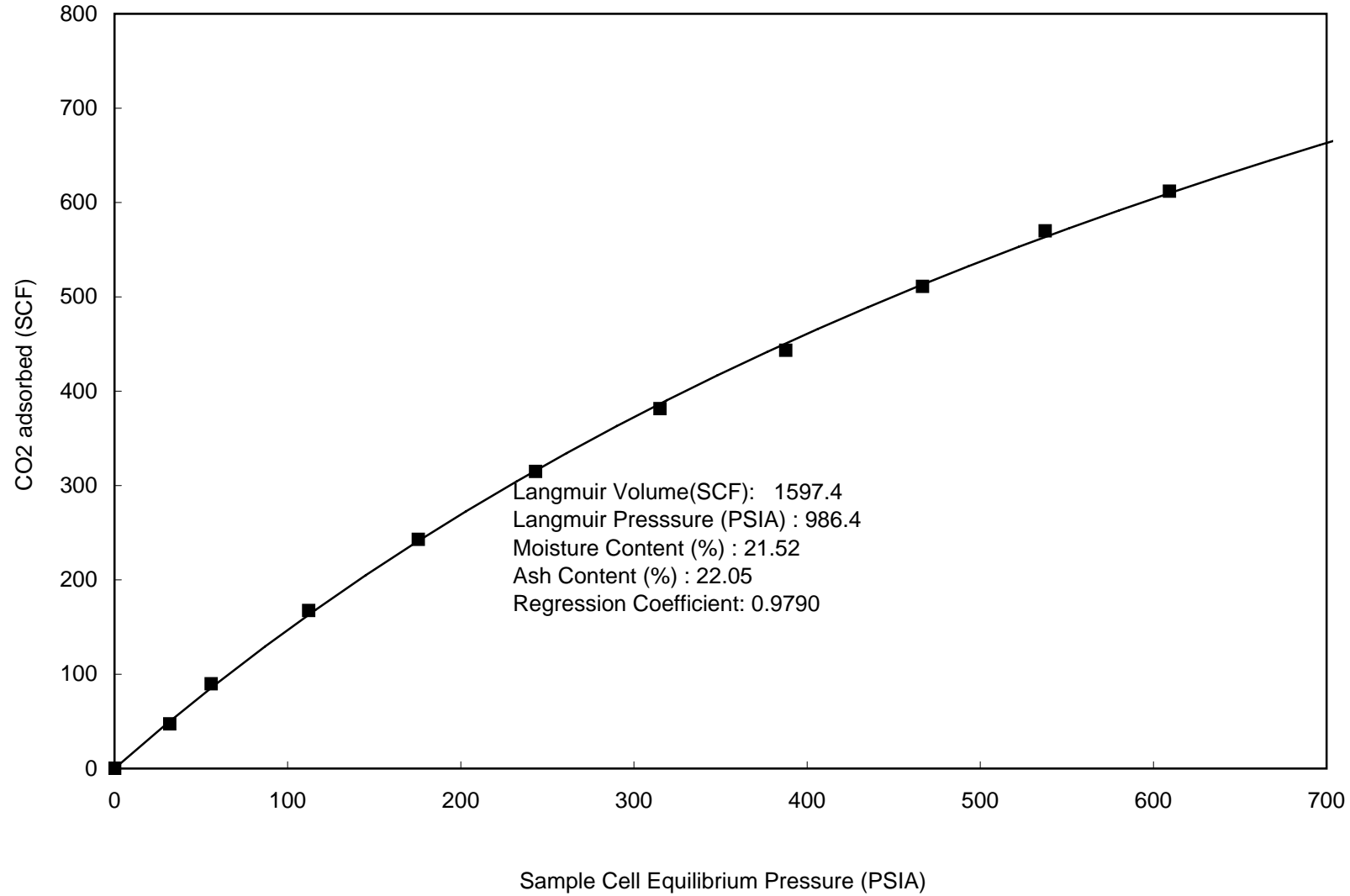
32	34	0.93
56	65	0.86
112	121	0.93
175	176	1.00
243	228	1.07
315	276	1.14
388	321	1.21
467	370	1.26
538	413	1.30
609	443	1.38

Saturated Monolayer Volume (SCF/ton):	1156
Langmuir Pressure (PSIA):	986
Correlation Coefficient:	0.9790

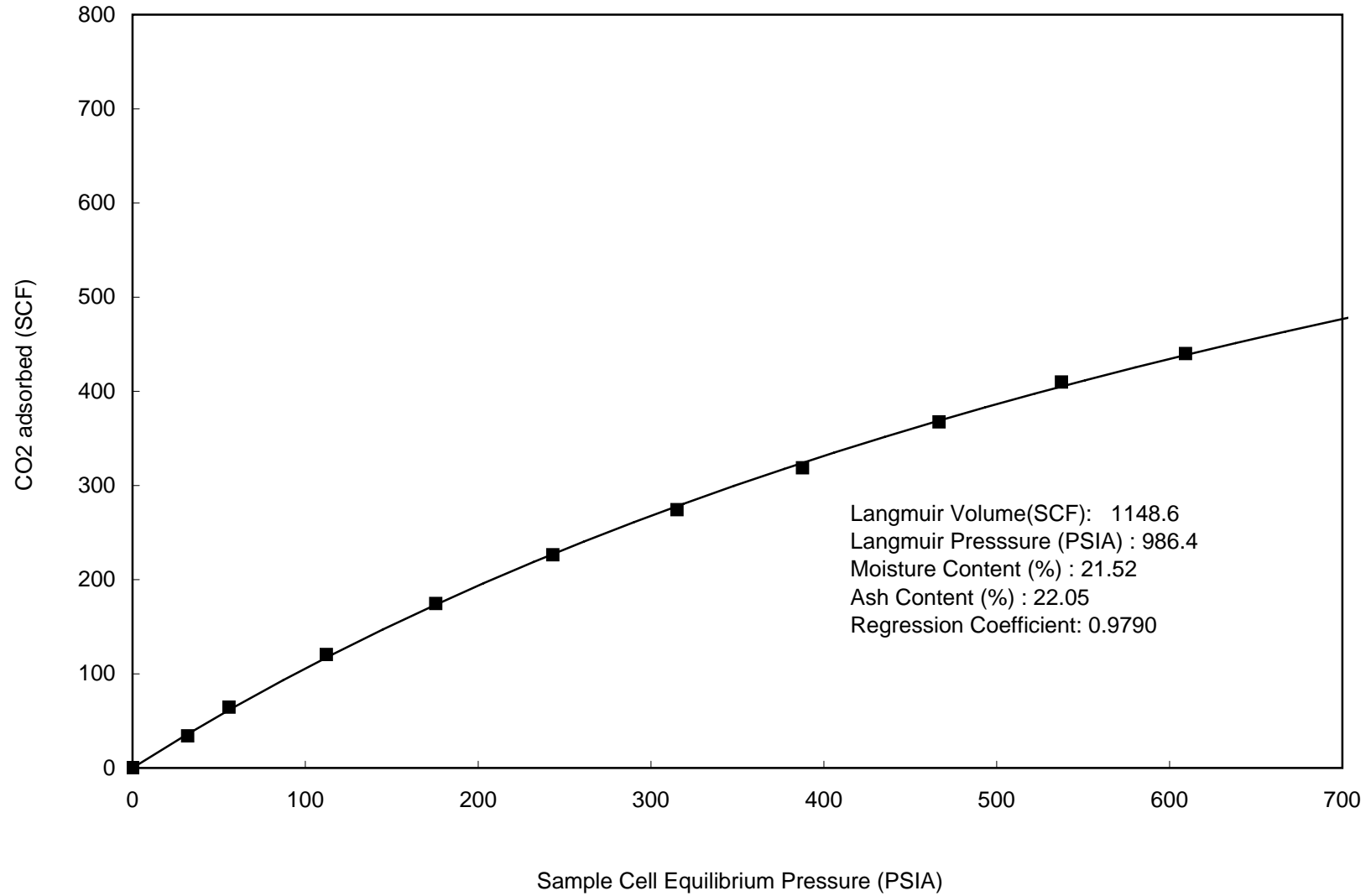
5-1A Carbon Dioxide (as received basis)



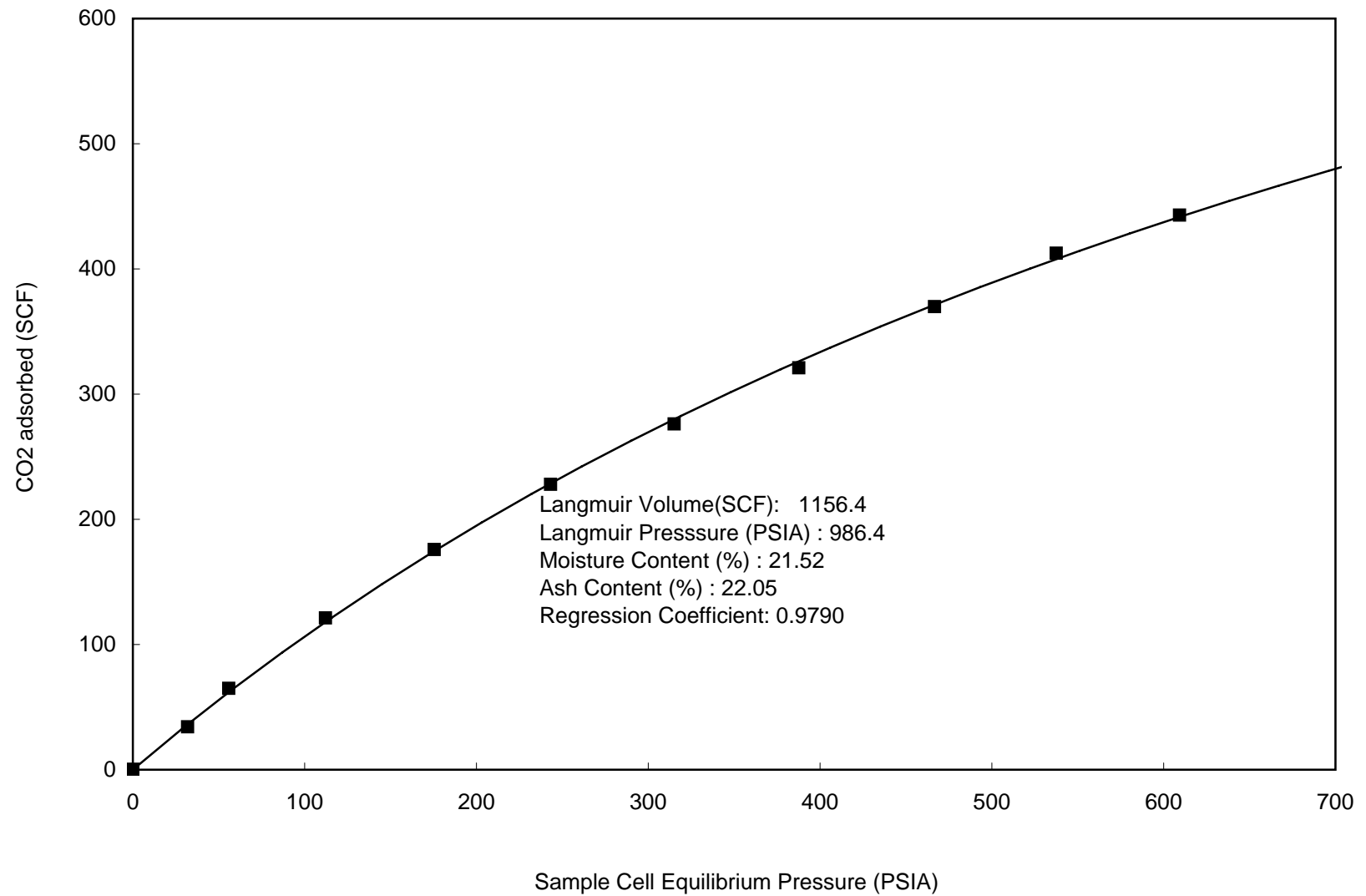
5-1A Carbon Dioxide (dry & ash free basis)



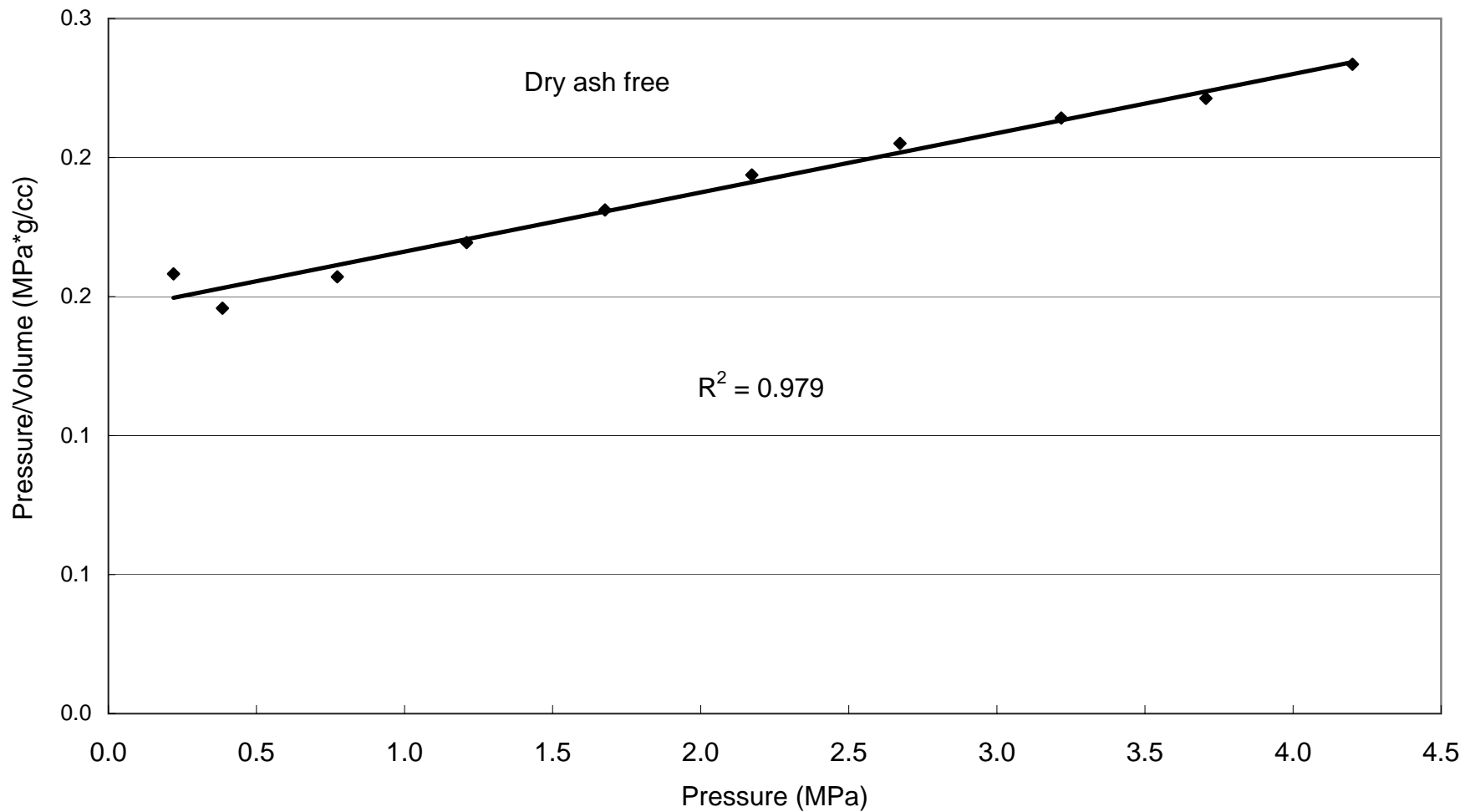
5-1A Carbon Dioxide (moisture free, ash included basis)



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



Adsorption Langmuir Plot



5-1A Carbon Dioxide

CO2 Adsorption (SI Units)

Summary of Analyses

	As Received	DAF basis
Langmuir Volume cc/g	26.49	46.95
Langmuir Pressure MPa	6.80	6.80
Goodness of fit Langmuir		
Equation R-squared	0.98	0.98
Ash Content Wt.%	22.05	22.05
Equilibrium Moisture Wt.%	21.52	21.52

Contents of Appendix

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As Received
Dry Ash Free
Dry Ash Included
Moist Ash Free

Charts

As Received
Dry Ash Free
Dry Ash Included
Moist Ash Free

5-1A Carbon Dioxide
GAS ADSORPTION ISOTHERM SI UNITS

AS RECEIVED BASIS

Sample I.D. : 5-1A Carbon Dioxide Moisture Content (EQ) % : 21.52

Isotherm Temperature ° C: 36.1 Ash Content % : 22.05

Gas used: CO2 Helium Density g/cc 1.545

PRESSURE (MPa)	ADSORBED GAS (cc/g @STP)	P / V
0.220	0.78	0.280
0.385	1.49	0.258
0.773	2.78	0.278
1.210	4.03	0.300
1.677	5.22	0.321
2.172	6.33	0.343
2.673	7.35	0.363
3.217	8.47	0.380
3.706	9.45	0.392
4.201	10.15	0.414

Saturated Monolayer Volume (cc/g @ STP): 26.49

Langmuir Pressure (MPa): 6.80

DRY ASH FREE BASIS

0.220	1.39	0.158
0.385	2.64	0.146
0.773	4.92	0.157
1.210	7.14	0.169
1.677	9.25	0.181
2.172	11.21	0.194
2.673	13.03	0.205
3.217	15.02	0.214
3.706	16.75	0.221
4.201	17.98	0.234

Saturated Monolayer Volume (cc/g @ STP, daf): 46.95

Langmuir Pressure (MPa): 6.80

Correlation Coefficient: 0.9790

5-1A Carbon Dioxide

GAS ADSORPTION ISOTHERM SI UNITS

MOISTURE FREE ASH INCLUDED

Isotherm Temperature ° C:	36.1	Moisture Content (EQ) % :	21.52
Gas used:	CO2	Ash Content % :	22.05
		Helium Density g/cc	1.545

PRESSURE (MPa)	ADSORBED GAS (cc/g@STP)	P / V
0.220	1.00	0.22
0.385	1.90	0.20
0.773	3.54	0.22
1.210	5.13	0.24
1.677	6.65	0.25
2.172	8.06	0.27
2.673	9.37	0.29
3.217	10.80	0.30
3.706	12.04	0.31
4.201	12.93	0.32

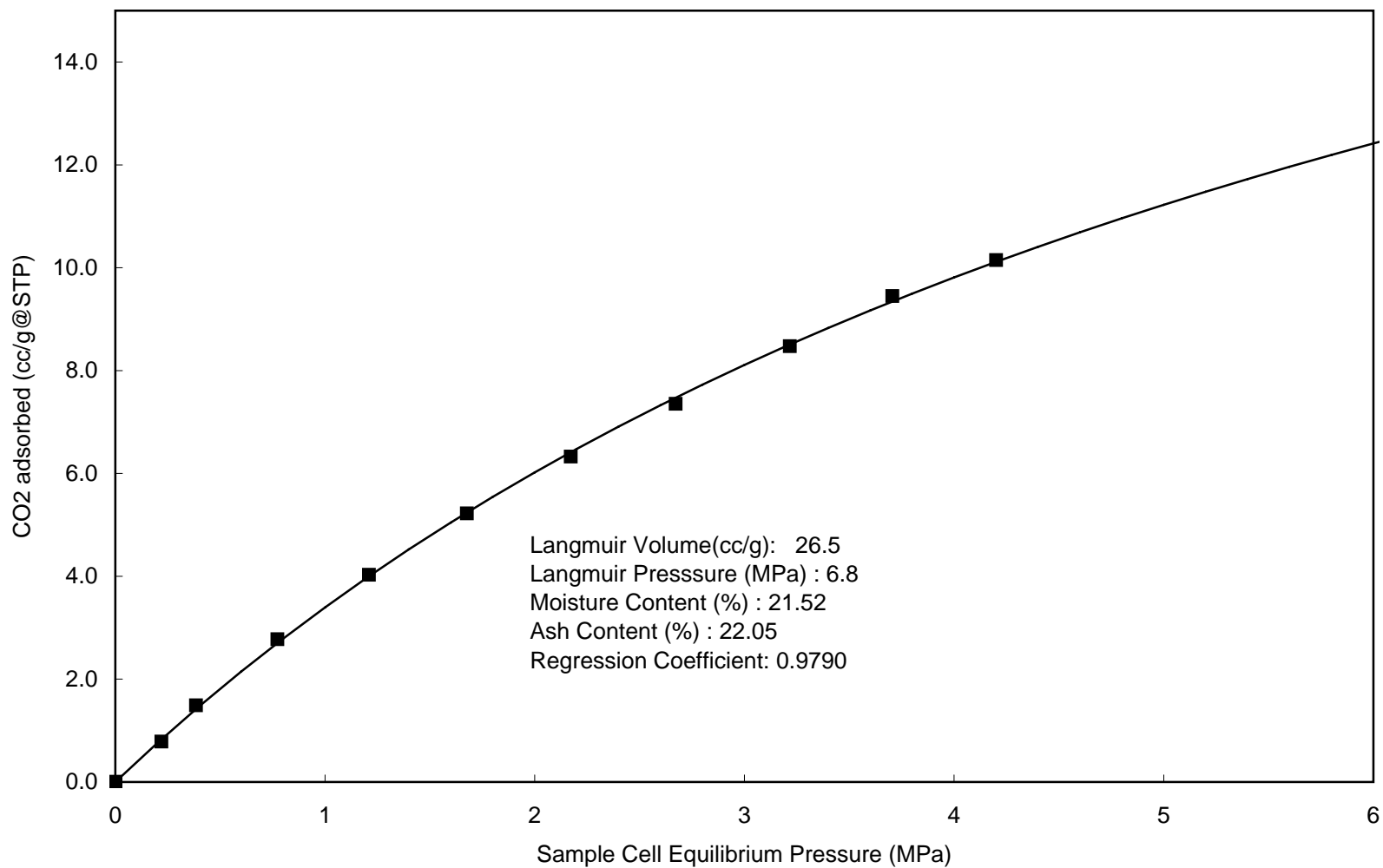
Saturated Monolayer Volume (cc/g):	33.76
Langmuir Pressure (MPa):	6.80

ASH FREE MOISTURE INCLUDED

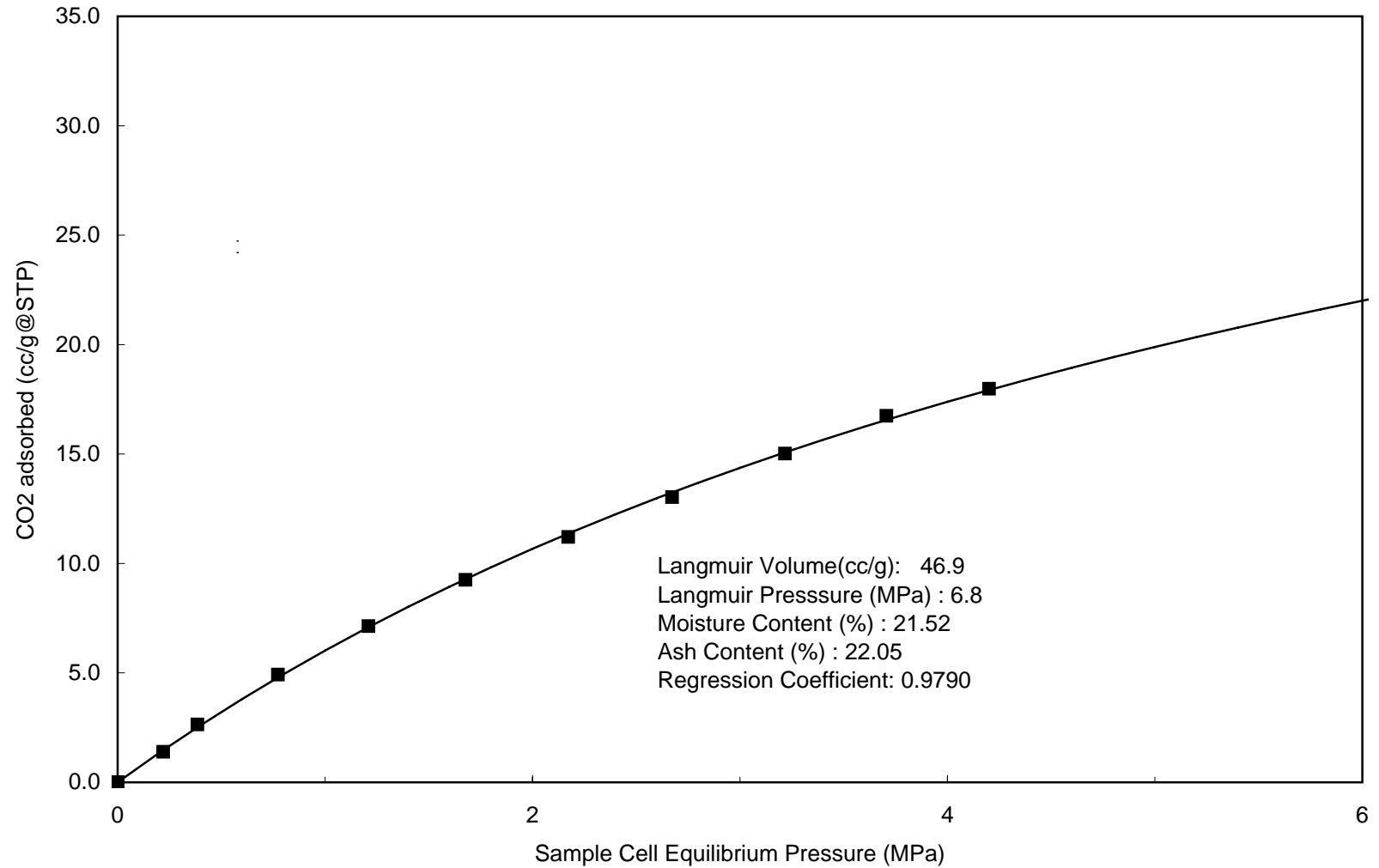
0.220	1.01	0.00
0.385	1.91	0.20
0.773	3.56	0.22
1.210	5.17	0.23
1.677	6.70	0.25
2.172	8.12	0.27
2.673	9.43	0.28
3.217	10.87	0.30
3.706	12.12	0.31
4.201	13.02	0.32

Saturated Monolayer Volume (cc/g, ash free):	33.99
Langmuir Pressure (MPa):	6.80
Correlation Coefficient:	0.9790

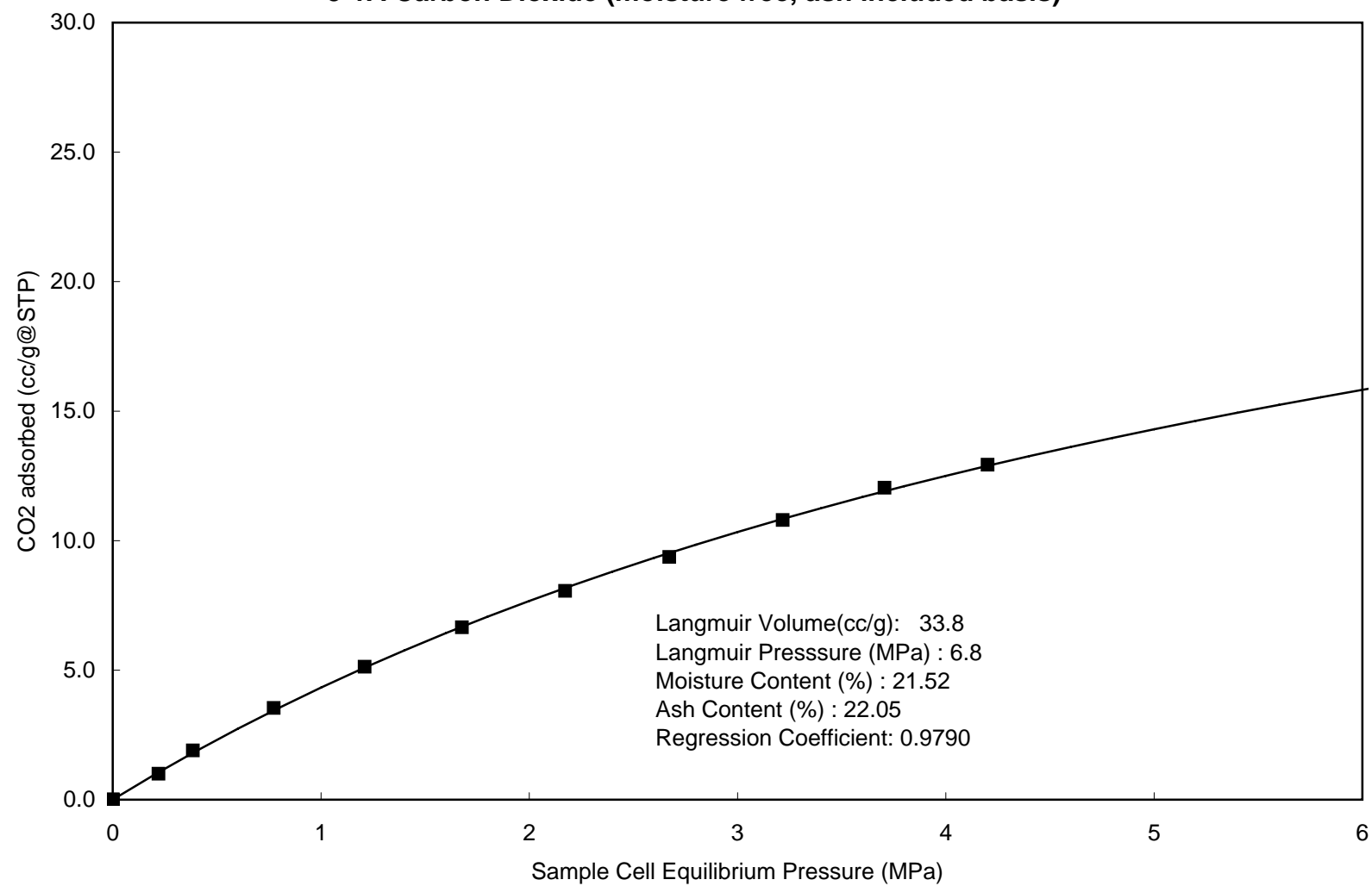
5-1A Carbon Dioxide (as received basis)



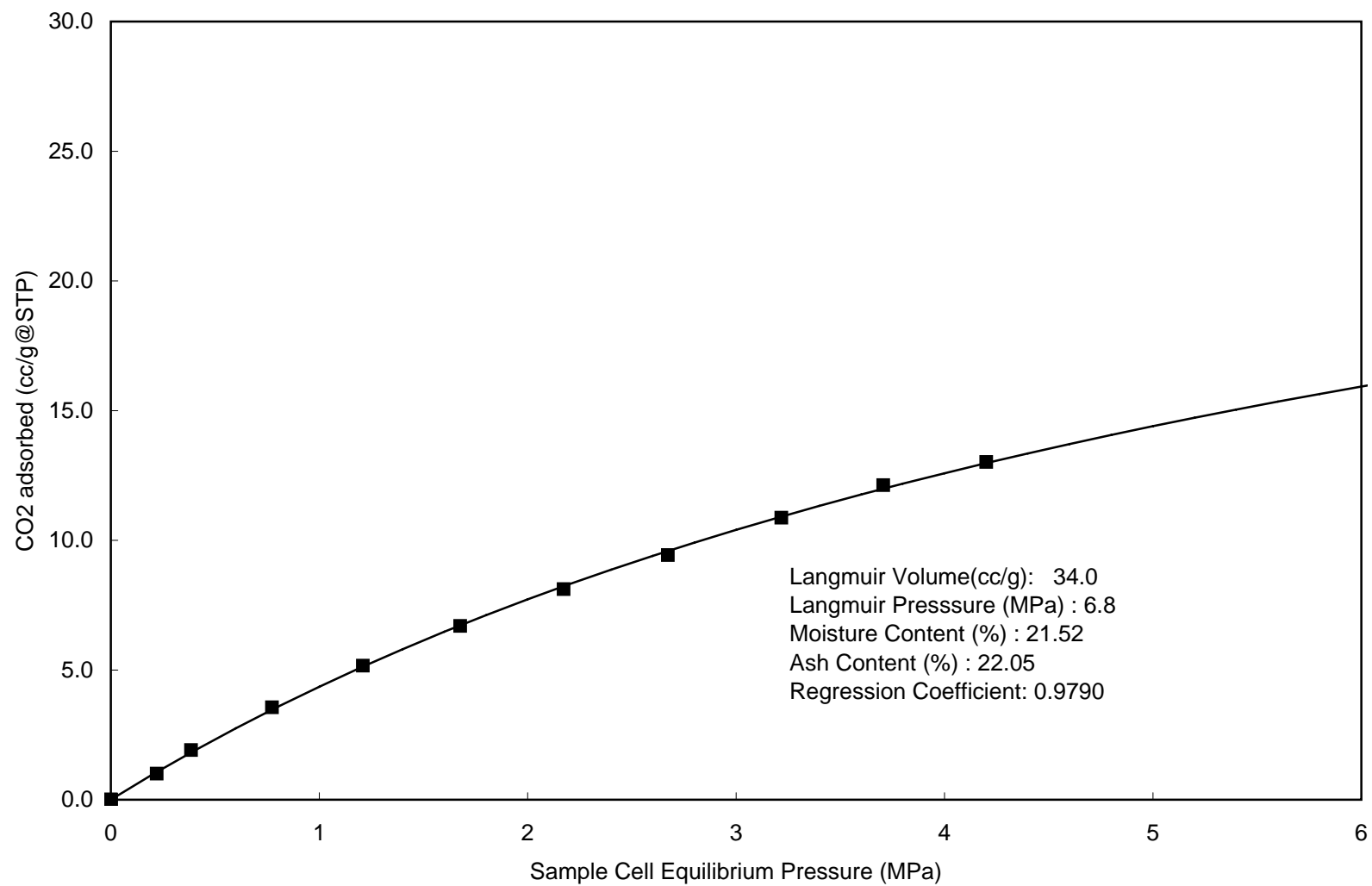
5-1A Carbon Dioxide (dry & ash free basis)



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



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



Adsorption Langmuir Plot

