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APÊNDICE A

A.1.

Determinação do número de células durante o ensaio de adsorção em batelada

Nesta seção são apresentadas as tabelas de resultados obtidas no laboratório durante a execução dos ensaios de adsorção em batelada através da técnica de contagem em placa "pour plate", para a determinação dos parâmetros N_t (número total de células) e N_s (número de células no sobrenadante). Valores utilizados para a obtenção da isoterma de adsorção de *E. coli* em areia de quartzo. Foram realizados ensaios para quatro concentrações iniciais 10^6 , 10^7 , 10^8 e 10^9 cel/mL

- **Concentração de 10^6 cel/mL**

Determinação de N_t [UFC] para o tempo inicial T_0 :

	Diluições			
	-2	-3	-4	-5
DUPLICATA 1	1136,00	99,00 123,00 144,00	13,00 18,00 14,00	0,00 1,00 0,00
media [UFC/0,1ml]	1136,00	122,00	15,00	0,33
UFC/ml	1,14E+06	1,22E+06	1,50E+06	3,33E+05
N_t [UFC]	2,27E+07	2,44E+07	3,00E+07	6,67E+06
DUPLICATA 2	1620,00	182,00 235,00 222,00	18,00 12,00 27,00	3,00 2,00 1,00
media [UFC/0,1ml]	1620,00	213,00	19,00	2,00
UFC/ml	1,62E+06	2,13E+06	1,90E+06	2,00E+06
N_t [UFC]	3,24E+07	4,26E+07	3,80E+07	4,00E+07

Determinação de N_s [UFC] para o tempo final T_1 :

	Diluições			
	-2	-3	-4	-5
DUPLICATA 1	1564,00	182,00	35,00	1,00
		176,00	20,00	3,00
		195,00	16,00	4,00
media [UFC/0,1ml]	1564,00	184,33	23,67	2,67
UFC/ml	1,56E+06	1,84E+06	2,37E+06	2,67E+06
N_s [UFC]	3,13E+07	3,69E+07	4,73E+07	5,33E+07
DUPLICATA 2	1124,00	195,00	20,00	1,00
		190,00	32,00	4,00
		186,00	25,00	3,00
media [UFC/0,1ml]	1124,00	190,33	25,67	2,67
UFC/ml	1,12E+06	1,90E+06	2,57E+06	2,67E+06
N_s [UFC]	2,25E+07	3,81E+07	5,13E+07	5,33E+07

- **Concentração de 10^7 cel/mL**

Determinação de N_t [UFC] para o tempo inicial T_0 :

	Diluições			
	-3	-4	-5	-6
DUPLICATA 1	1528,00	288,00	13,00	4,00
	1944,00	249,00	9,00	2,00
		276,00	21,00	6,00
media [UFC/0,1ml]	1736,00	271,00	14,33	4,00
UFC/ml	1,74E+07	2,71E+07	1,43E+07	4,00E+07
N_t [UFC]	3,47E+08	5,42E+08	2,87E+08	8,00E+08
DUPLICATA 2	836,00	172,00	6,00	1,00
	468,00	204,00	2,00	0,00
	800,00	215,00	6,00	1,00
media [UFC/0,1ml]	701,33	197,00	4,67	0,67
UFC/ml	7,01E+06	1,97E+07	4,67E+06	6,67E+06
N_t [UFC]	1,40E+08	3,94E+08	9,33E+07	1,33E+08

Determinação de N_s [UFC] para o tempo final T_1 :

	Diluições			
	-3	-4	-5	-6
DUPLICATA 1	1836,00	16,00	18,00	5,00
	1240,00	34,00	29,00	2,00
		45,00	40,00	5,00
media [UFC/0,1ml]	1538,00	31,67	29,00	4,00
UFC/ml	1,54E+07	3,17E+06	2,90E+07	4,00E+07
N_s [UFC]	3,08E+08	6,33E+07	5,80E+08	8,00E+08
DUPLICATA 2	456,00	167,00	9,00	3,00
	399,00	130,00	12,00	1,00
	472,00	252,00	12,00	3,00
media [UFC/0,1ml]	442,33	183,00	11,00	2,33
UFC/ml	4,42E+06	1,83E+07	1,10E+07	2,33E+07
N_s [UFC]	8,85E+07	3,66E+08	2,20E+08	4,67E+08

Não foram considerados os valores que correspondem à diluição 10^{-4} para a Duplicata 1.

- **Concentração de 10^8 cel/mL**

Determinação de N_t [UFC] para o tempo inicial T_0 :

	Diluições			
	-4	-5	-6	-7
DUPLICATA 1	1560,00	332,00	68,00	1,00
	1744,00	347,00	57,00	12,00
		339,00	42,00	6,00
media [UFC/0,1ml]	1652,00	339,33	55,67	6,33
UFC/ml	1,65E+08	3,39E+08	5,57E+08	6,33E+08
N_t [UFC]	3,30E+09	6,79E+09	1,11E+10	1,27E+10
DUPLICATA 2	2264,00	325,00	32,00	8,00
	2116,00	302,00	37,00	3,00
		345,00	34,00	6,00
media [UFC/0,1ml]	2190,00	324,00	34,33	5,67
UFC/ml	2,19E+08	3,24E+08	3,43E+08	5,67E+08
N_t [UFC]	4,38E+09	6,48E+09	6,87E+09	1,13E+10

Determinação de N_s [UFC] para o tempo final T_1 :

	Diluições			
	-4	-5	-6	-7
DUPLICATA 1	1716,00	177,00	39,00	8,00
	1240,00	199,00	42,00	3,00
		203,00	42,00	7,00
media [UFC/0,1ml]	1478,00	193,00	41,00	6,00
UFC/ml	1,48E+08	1,93E+08	4,10E+08	6,00E+08
N_s [UFC]	2,96E+09	3,86E+09	8,20E+09	1,20E+10
DUPLICATA 2	792,00	96,00	37,00	10,00
	772,00	116,00	35,00	8,00
		147,00	30,00	14,00
media [UFC/0,1ml]	782,00	119,67	34,00	10,67
UFC/ml	7,82E+07	1,20E+08	3,40E+08	1,07E+09
N_s [UFC]	1,56E+09	2,39E+09	6,80E+09	2,13E+10

- **Concentração de 10^9 cel/mL**

Determinação de N_t [UFC] para o tempo inicial T_0 :

	Diluições			
	-5	-6	-7	-8
DUPLICATA 1	1508,00	317,00	32,00	5,00
		267,00	31,00	3,00
		339,00	23,00	1,00
media [UFC/0,1ml]	1508,00	307,67	28,67	3,00
UFC/ml	1,51E+09	3,08E+09	2,87E+09	3,00E+09
N_t [UFC]	3,02E+10	6,15E+10	5,73E+10	6,00E+10
DUPLICATA 2	1708,00	464,00	1188,00	748,00
media [UFC/0,1ml]	1708,00	464,00	1188,00	748,00
UFC/ml	1,71E+09	4,64E+09	1,19E+11	7,48E+11
N_t [UFC]	3,42E+10	9,28E+10	2,38E+12	1,50E+13

Não foram considerados os valores que correspondem às diluições 10^{-7} e 10^{-8} para a Duplicata 2.

Determinação de N_s [UFC] para o tempo final T_1 :

	Diluições			
	-5	-6	-7	-8
DUPLICATA 1	1868,00	452,00 394,00 416,00	189,00 207,00 216,00	65,00 50,00 57,00
media [UFC/0,1ml]	1868,00	420,67	204,00	57,33
UFC/ml	1,87E+09	4,21E+09	2,04E+10	5,73E+10
N_s [UFC]	3,74E+10	8,41E+10	4,08E+11	1,15E+12
DUPLICATA 2	724,00	59,00 89,00 55,00	21,00 26,00 21,00	1,00 2,00 3,00
media [UFC/0,1ml]	724,00	67,67	22,67	2,00
UFC/ml	7,24E+08	6,77E+08	2,27E+09	2,00E+09
N_s [UFC]	1,45E+10	1,35E+10	4,53E+10	4,00E+10

Não foram considerados os valores que correspondem às diluições 10^{-7} e 10^{-8} para a Duplicata 1.

A.2. Cálculo do coeficiente de distribuição K_D

- Concentração de 10^6 cel/mL

	Dil	Co UFC/ml	Nt UFC	N_s UFC	Pa %	Cs cel/g	Cw cel/ml	K_D ml/g
DUPLICATA 1	-2	1,14E+06	2,27E+07	3,13E+07	-37,7	-4,27E+06	1,56E+06	-2,7
	-3	1,22E+06	2,44E+07	3,69E+07	-51,1	-6,21E+06	1,84E+06	-3,4
	-4	1,50E+06	3,00E+07	4,73E+07	-57,8	-8,64E+06	2,37E+06	-3,6
	-5	3,33E+05	6,67E+06	5,33E+07	-700,0	-2,33E+07	2,67E+06	-8,7
DUPLICATA 2	-2	1,62E+06	3,24E+07	2,25E+07	30,6	4,96E+06	1,12E+06	4,4
	-3	2,13E+06	4,26E+07	3,81E+07	10,6	2,27E+06	1,90E+06	1,2
	-4	1,90E+06	3,80E+07	5,13E+07	-35,1	-6,67E+06	2,57E+06	-2,6
	-5	2,00E+06	4,00E+07	5,33E+07	-33,3	-6,67E+06	2,67E+06	-2,5

O valor de K_D determinado para a concentração 10^6 cel/mL corresponde ao valor da tabela calculado para a diluição 10^{-3} da Duplicata 2 igual a 1,2 mL/g.

- Concentração de 10^7 cel/mL

	Dil	Co UFC/ml	Nt UFC	N_s UFC	Pa %	Cs cel/g	Cw cel/ml	K_D ml/g
DUPLICATA 1	-3	1,74E+07	3,47E+08	3,08E+08	11,4	1,97E+07	1,54E+07	1,3
	-4	2,71E+07	5,42E+08	6,33E+07	88,3	2,38E+08	3,17E+06	75,3
	-5	1,43E+07	2,87E+08	5,80E+08	-102,3	-1,46E+08	2,90E+07	-5,0
	-6	4,00E+07	8,00E+08	8,00E+08	0,0	0,00E+00	4,00E+07	0,0
DUPLICATA 2	-3	7,01E+06	1,40E+08	8,85E+07	36,9	2,59E+07	4,42E+06	5,9
	-4	1,97E+07	3,94E+08	3,66E+08	7,1	1,40E+07	1,83E+07	0,8
	-5	4,67E+06	9,33E+07	2,20E+08	-135,7	-6,33E+07	1,10E+07	-5,8
	-6	6,67E+06	1,33E+08	4,67E+08	-250,0	-1,67E+08	2,33E+07	-7,1

	Dil	Co UFC/ml	Nt UFC	Ns UFC	Pa %	Cs cel/g	Cw cel/ml	K _D ml/g
DUPLICATA 1	-4	2,71E+07	5,42E+08					
	-3			3,08E+08				
media			5,42E+08	3,08E+08	43,2	1,17E+08	1,54E+07	7,6
DUPLICATA 2	-4	1,97E+07	3,94E+08	3,66E+08				
			3,94E+08	3,66E+08	7,1	1,40E+07	1,83E+07	0,8
		2,34E+07	4,68E+08		25,2	6,56E+07	1,68E+07	4,2

O valor de K_D determinado para a concentração 10⁷ cel/mL corresponde ao valor médio, dos valores calculados para as diluições 10⁻⁴ e 10⁻³ da Duplicata 1 e a diluição 10⁻⁴ da Duplicata 2. Assim o valor de K_D resulta ser igual a 4,2 mL/g.

- **Concentração de 10⁸ cel/mL**

	Dil	Co UFC/ml	Nt UFC	Ns UFC	Pa %	Cs cel/g	Cw cel/ml	K _D ml/g
DUPLICATA 1	-4	1,65E+08	3,30E+09	2,96E+09	10,5	1,74E+08	1,48E+08	1,2
	-5	3,39E+08	6,79E+09	3,86E+09	43,1	1,46E+09	1,93E+08	7,6
	-6	5,57E+08	1,11E+10	8,20E+09	26,3	1,47E+09	4,10E+08	3,6
	-7	6,33E+08	1,27E+10	1,20E+10	5,3	3,33E+08	6,00E+08	0,6
DUPLICATA 2	-4	2,19E+08	4,38E+09	1,56E+09	64,3	1,41E+09	7,82E+07	18,0
	-5	3,24E+08	6,48E+09	2,39E+09	63,1	2,04E+09	1,20E+08	17,0
	-6	3,43E+08	6,87E+09	6,80E+09	1,0	3,33E+07	3,40E+08	0,1
	-7	5,67E+08	1,13E+10	2,13E+10	-88,2	-4,99E+09	1,07E+09	-4,7

	Dil	Co UFC/ml	Nt UFC	Ns UFC	Pa %	Cs cel/g	Cw cel/ml	K _D ml/g
DUPLICATA 1	-5	3,39E+08	6,79E+09	3,86E+09				
	-6	5,57E+08	1,11E+10	8,20E+09				
media			8,96E+09	6,03E+09	32,7	1,47E+09	3,02E+08	4,9
DUPLICATA 2	-5	3,24E+08	6,48E+09	2,39E+09				
	-6	3,43E+08	6,87E+09	6,80E+09				
media			6,67E+09	4,60E+09	31,1	1,04E+09	2,30E+08	4,5
		3,91E+08			31,9	1,25E+09	2,66E+08	4,7

O valor de K_D determinado para a concentração 10⁸ cel/mL corresponde ao valor médio, dos valores calculados para a Duplicata 1 e a Duplicata 2, utilizando a média das diluições 10⁻⁵ e 10⁻⁶. Assim o valor de K_D resulta ser igual a 4,7 mL/g.

- **Concentração de 10⁹ cel/mL**

	Dil	Co UFC/ml	Nt UFC	Ns UFC	Pa %	Cs cel/g	Cw cel/ml	K _D ml/g
DUPLICATA 1	-5	1,51E+09	3,02E+10	3,74E+10	-23,9	-3,61E+09	1,87E+09	-1,9
	-6	3,08E+09	6,15E+10	8,41E+10	-36,7	-1,13E+10	4,21E+09	-2,7
	-7	2,87E+09	5,73E+10					
	-8	3,00E+09	6,00E+10					
DUPLICATA 2	-5	1,71E+09	3,42E+10	1,45E+10	57,6	9,84E+09	7,24E+08	13,6
	-6	4,64E+09	9,28E+10	1,35E+10	85,4	3,96E+10	6,77E+08	58,6
	-7			4,53E+10				
	-8			4,00E+10				

O valor de K_D determinado para a concentração 10⁹ cel/mL corresponde ao valor calculado considerando a diluição 10⁻⁶ (para N_t) da Duplicata 1 e 10⁻⁶ da Duplicata 2 (para N_s). Assim o valor de K_D resulta ser igual a 35,5 mL/g.

APÊNDICE B

B.1.

Dados para a construção da curva de chegada

- **Ensaio 1 (i=0,03)**

Volume [cm³]= 633,38	pd[g/cm³]= 1,89	G= 2,64
Peso seco [g]= 1197,8	1pV [ml]= 179,67	e= 0,40
(Dil 1/1) Abs= 0,457	Co cel/ml = 1,07E+08	n= 0,28

N°	Absorbância [A]	N° cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,006	-2,71E+06	0,00E+00	0,00	20,0	0,1	0,00E+00	0,00
1	0,020	6,84E+05	6,84E+05	0,01	170,0	0,9	0,00E+00	0,00
2	0,062	1,09E+07	1,09E+07	0,10	275,0	1,5	1,70E+07	0,15
3	0,276	6,27E+07	6,27E+07	0,59	380,0	2,1	8,48E+07	0,74
4	0,238	5,35E+07	5,35E+07	0,50	470,0	2,6		
5	0,242	5,45E+07	5,45E+07	0,51	565,0	3,1	5,83E+07	0,51
6	0,266	6,03E+07	6,03E+07	0,57	660,0	3,7		
7	0,300	6,85E+07	6,85E+07	0,64	750,0	4,2	8,88E+07	0,77
8	0,336	7,73E+07	7,73E+07	0,72	840,0	4,7		
9	0,359	8,28E+07	8,28E+07	0,78	935,0	5,2		
10	0,378	8,74E+07	8,74E+07	0,82	1025,0	5,7	1,13E+08	0,98
11	0,387	8,96E+07	8,96E+07	0,84	1115,0	6,2		
12	0,399	9,25E+07	9,25E+07	0,87	1210,0	6,7	7,90E+07	0,69
13	0,412	9,57E+07	9,57E+07	0,90	1305,0	7,3		
14	0,422	9,81E+07	9,81E+07	0,92	1390,0	7,7	1,22E+08	1,06
15	0,587	1,38E+08	1,38E+08	1,30	1930,0	10,7	1,42E+08	1,23
16	0,607	1,43E+08	1,43E+08	1,34	1960,0	10,9		

• **Ensaio 2 (i=0,06)**

Volume [cm3]= 633,38

Peso seco [g]= 1180

Abs= 0,443

pd[g/cm3]= 1,86

1pV [ml]= 186,41

Co cel/ml = 1,65E+08

G= 2,64

e= 0,42

n= 0,29

N°	Absorbância [A]	N° cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,005	-2,95E+06	0,00E+00	0,00	16,0	0,1	0,00E+00	0,00
1	0,010	-1,74E+06	0,00E+00	0,00	176,0	0,9		
2	0,074	1,38E+07	1,38E+07	0,08	311,0	1,7	1,36E+07	0,08
3	0,142	3,02E+07	3,02E+07	0,18	437,0	2,3		
4	0,213	4,75E+07	4,75E+07	0,29	567,0	3,0		
5	0,307	7,02E+07	7,02E+07	0,43	702,0	3,8	6,57E+07	0,40
6	0,423	9,83E+07	9,83E+07	0,60	852,0	4,6		
7	0,497	1,16E+08	1,16E+08	0,70	957,0	5,1		
8	0,598	1,41E+08	1,41E+08	0,85	1062,0	5,7		
9	0,621	1,46E+08	1,46E+08	0,89	1212,0	6,5	1,40E+08	0,85
10	0,626	1,48E+08	1,48E+08	0,89	1362,0	7,3		
11	0,635	1,50E+08	1,50E+08	0,91	1457,0	7,8		
12	0,651	1,54E+08	1,54E+08	0,93	1593,0	8,5		
13	0,651	1,54E+08	1,54E+08	0,93	1593,0	8,5		

• **Ensaio 3 (i=0,06)**

Volume [cm3]= 633,38

Peso seco [g]= 1177,2

Abs= 0,656

pd[g/cm3]= 1,86

1pV [ml]= 187,48

Co cel/ml = 1,55E+08

G= 2,64

e= 0,42

n= 0,30

N°	Absorbância [A]	N° cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,015	-5,27E+05	0,00E+00	0,00	15,0	0,1	0,00E+00	0,00
1	0,022	1,17E+06	1,17E+06	0,01	130,0	0,7		
2	0,031	3,35E+06	3,35E+06	0,02	231,0	1,2	2,75E+06	0,02
3	0,090	1,76E+07	1,76E+07	0,11	355,0	1,9		
4	0,142	3,02E+07	3,02E+07	0,20	490,0	2,6	3,05E+07	0,25
5	0,214	4,77E+07	4,77E+07	0,31	615,0	3,3		
6	0,319	7,31E+07	7,31E+07	0,47	740,0	3,9	6,15E+07	0,51
7	0,398	9,23E+07	9,23E+07	0,60	850,0	4,5		
8	0,468	1,09E+08	1,09E+08	0,71	970,0	5,2	7,68E+07	0,63
9	0,494	1,16E+08	1,16E+08	0,75	1070,0	5,7		
10	0,543	1,27E+08	1,27E+08	0,82	1170,0	6,2	1,01E+08	0,83
11	0,524	1,23E+08	1,23E+08	0,79	1305,0	7,0		
12	0,531	1,25E+08	1,25E+08	0,80	1415,0	7,5	9,95E+07	0,82
13	0,582	1,37E+08	1,37E+08	0,88	1525,0	8,1		
14	0,583	1,37E+08	1,37E+08	0,89	1650,0	8,8	9,90E+07	0,81
15	0,611	1,44E+08	1,44E+08	0,93	1775,0	9,5		
16	0,635	1,50E+08	1,50E+08	0,97	1915,0	10,2	1,12E+08	0,92
17	0,668	1,58E+08	1,58E+08	1,02	2030,0	10,8		
18	0,680	1,61E+08	1,61E+08	1,04	2135,0	11,4		

• **Ensaio 4 (i=0,06)**

Volume [cm3]= 633,38

Peso seco [g]= 1181,1

Abs= 0,754

pd[g/cm3]= 1,86

1pV [ml]= 186,00

Co cel/ml = 1,79E+08

G= 2,64

e= 0,42

n= 0,29

Nº	Absorbância [A]	Nº cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,008	-2,22E+06	0,00E+00	0,00	15,0	0,1	0,00E+00	0,00
1	0,011	-1,50E+06	0,00E+00	0,00	140,0	0,8		
2	0,062	1,09E+07	1,09E+07	0,06	260,0	1,4	8,45E+06	0,04
3	0,129	2,71E+07	2,71E+07	0,15	390,0	2,1		
4	0,166	3,61E+07	3,61E+07	0,20	515,0	2,8	2,90E+07	0,13
5	0,224	5,01E+07	5,01E+07	0,28	631,0	3,4		
6	0,307	7,02E+07	7,02E+07	0,39	741,0	4,0	8,30E+07	0,38
7	0,400	9,28E+07	9,28E+07	0,52	859,0	4,6		
8	0,475	1,11E+08	1,11E+08	0,62	969,0	5,2	1,24E+08	0,57
9	0,528	1,24E+08	1,24E+08	0,69	1074,0	5,8		
10	0,575	1,35E+08	1,35E+08	0,76	1184,0	6,4	1,63E+08	0,75
11	0,614	1,45E+08	1,45E+08	0,81	1299,0	7,0		
12	0,645	1,52E+08	1,52E+08	0,85	1414,0	7,6	1,85E+08	0,85
13	0,668	1,58E+08	1,58E+08	0,88	1539,0	8,3		
14	0,681	1,61E+08	1,61E+08	0,90	1659,0	8,9	1,93E+08	0,89
15	0,686	1,62E+08	1,62E+08	0,91	1784,0	9,6		
16	0,690	1,63E+08	1,63E+08	0,91	1910,0	10,3	2,00E+08	0,92
17	0,692	1,64E+08	1,64E+08	0,92	2030,0	10,9		
18	0,693	1,64E+08	1,64E+08	0,92	2135,0	11,5		

• **Ensaio 5 (i=0,16)**

Volume [cm3]= 633,38

Peso seco [g]= 1183,4

Abs= 0,689

pd[g/cm3]= 1,87

1pV [ml]= 185,13

Co cel/ml = 1,63E+08

G= 2,64

e= 0,41

n= 0,29

Nº	Absorbância [A]	Nº cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,007	-2,47E+06	0,00E+00	0,00	15,0	0,1	0,00E+00	0,00
1	0,025	1,90E+06	1,90E+06	0,01	210,0	1,1	2,50E+05	0,00
2	0,119	2,47E+07	2,47E+07	0,15	395,0	2,1	1,93E+07	0,14
3	0,193	4,26E+07	4,26E+07	0,26	570,0	3,1	2,96E+07	0,21
4	0,281	6,39E+07	6,39E+07	0,39	737,0	4,0	4,34E+07	0,31
5	0,357	8,24E+07	8,24E+07	0,51	892,0	4,8		0,00
6	0,425	9,88E+07	9,88E+07	0,61	1047,0	5,7	6,85E+07	0,50
7	0,475	1,11E+08	1,11E+08	0,68	1202,0	6,5		0,00
8	0,513	1,20E+08	1,20E+08	0,74	1357,0	7,3	9,58E+07	0,69
9	0,544	1,28E+08	1,28E+08	0,78	1507,0	8,1		0,00
10	0,572	1,34E+08	1,34E+08	0,83	1662,0	9,0	1,02E+08	0,74
11	0,608	1,43E+08	1,43E+08	0,88	1822,0	9,8	1,07E+08	0,77
12	0,638	1,50E+08	1,50E+08	0,92	1988,0	10,7	1,40E+08	1,01
13	0,673	1,59E+08	1,59E+08	0,98	2158,0	11,7	1,17E+08	0,85
14	0,707	1,67E+08	1,67E+08	1,03	2328,0	12,6	1,60E+08	1,16

• **Ensaio 6 (i=0,24)**

Volume [cm³]= 633,38

Peso seco [g]= 1183,4

Abs= 0,595

pd[g/cm³]= 1,87

1pV [ml]= 185,13

Co cel/ml = 1,40E+08

G= 2,64

e= 0,41

n= 0,29

N°	Absorbância [A]	N° cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,007	-2,47E+06	0,00E+00	0,00	15,0	0,1	0,00E+00	0,00
1	0,015	-5,27E+05	0,00E+00	0,00	190,0	1,0	2,50E+05	0,00
2	0,089	1,74E+07	1,74E+07	0,12	365,0	2,0	1,93E+07	0,14
3	0,133	2,81E+07	2,81E+07	0,20	536,0	2,9	2,96E+07	0,21
4	0,181	3,97E+07	3,97E+07	0,28	702,0	3,8	4,34E+07	0,31
5	0,231	5,18E+07	5,18E+07	0,37	847,0	4,6		0,00
6	0,273	6,20E+07	6,20E+07	0,44	992,0	5,4	6,85E+07	0,50
7	0,317	7,27E+07	7,27E+07	0,52	1138,0	6,1		0,00
8	0,358	8,26E+07	8,26E+07	0,59	1288,0	7,0	9,58E+07	0,69
9	0,392	9,08E+07	9,08E+07	0,65	1433,0	7,7		0,00
10	0,432	1,01E+08	1,01E+08	0,72	1568,0	8,5	1,02E+08	0,74
11	0,469	1,09E+08	1,09E+08	0,78	1698,0	9,2	1,07E+08	0,77
12	0,506	1,18E+08	1,18E+08	0,85	1833,0	9,9	1,40E+08	1,01
13	0,543	1,27E+08	1,27E+08	0,91	1973,0	10,7	1,17E+08	0,85
14	0,567	1,33E+08	1,33E+08	0,95	2113,0	11,4	1,60E+08	1,16
15	0,589	1,39E+08	1,39E+08	0,99	2248,0	12,1	1,30E+08	0,94
16	0,605	1,42E+08	1,42E+08	1,02	2378,0	12,8	1,51E+08	1,09
17	0,626	1,48E+08	1,48E+08	1,05	2503,0	13,5		
18	0,659	1,56E+08	1,56E+08	1,11	2608,0	14,1		
19	0,686	1,62E+08	1,62E+08	1,16	2704,2	14,6		

• **Ensaio 7 (i=0,24)**

Volume [cm3]= 633,38

pd[g/cm3]= 1,89

G= 2,64

Peso seco [g]= 1195,7

1pV [ml]= 180,47

e= 0,40

Abs= 0,559

Co cel/ml = 1,31E+08

n= 0,28

N°	Absorbância [A]	N° cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,002	-3,68E+06	0,00E+00	0,00	15,0	0,1	4,00E+05	0,00
1	0,036	4,56E+06	4,56E+06	0,03	190,0	1,1		0,00
2	0,053	8,68E+06	8,68E+06	0,07	345,0	1,9	9,45E+06	0,07
3	0,085	1,64E+07	1,64E+07	0,13	510,0	2,8		0,00
4	0,112	2,30E+07	2,30E+07	0,18	655,0	3,6	2,16E+07	0,16
5	0,140	2,98E+07	2,98E+07	0,23	790,0	4,4		0,00
6	0,174	3,80E+07	3,80E+07	0,29	920,0	5,1	4,27E+07	0,32
7	0,205	4,55E+07	4,55E+07	0,35	1035,0	5,7		0,00
8	0,246	5,55E+07	5,55E+07	0,42	1160,0	6,4		0,00
9	0,281	6,39E+07	6,39E+07	0,49	1265,0	7,0	5,40E+07	0,41
10	0,303	6,93E+07	6,93E+07	0,53	1360,0	7,5	5,43E+07	0,41
11	0,332	7,63E+07	7,63E+07	0,58	1455,0	8,1		0,00
12	0,357	8,24E+07	8,24E+07	0,63	1550,0	8,6	8,70E+07	0,66
13	0,381	8,82E+07	8,82E+07	0,67	1645,0	9,1		0,00
14	0,417	9,69E+07	9,69E+07	0,74	1805,0	10,0	9,70E+07	0,73
15	0,433	1,01E+08	1,01E+08	0,77	1880,0	10,4		0,00
16	0,462	1,08E+08	1,08E+08	0,82	2030,0	11,2	9,65E+07	0,73
17	0,483	1,13E+08	1,13E+08	0,86	2165,0	12,0	1,07E+08	0,81
18	0,545	1,28E+08	1,28E+08	0,97	2290,0	12,7	1,47E+08	1,11
19	0,610	1,44E+08	1,44E+08	1,09	2405,0	13,3	1,55E+08	1,17
20	0,631	1,49E+08	1,49E+08	1,13	2510,0	13,9	1,56E+08	1,18
21	0,639	1,51E+08	1,51E+08	1,15	2605,0	14,4		0,00

• **Ensaio 8 (i=0,36)**

Volume [cm3]= 633,38

pd[g/cm3]= 1,90

G= 2,64

Peso seco [g]= 1206,46

1pV [ml]= 176,39

e= 0,39

Abs= 0,559

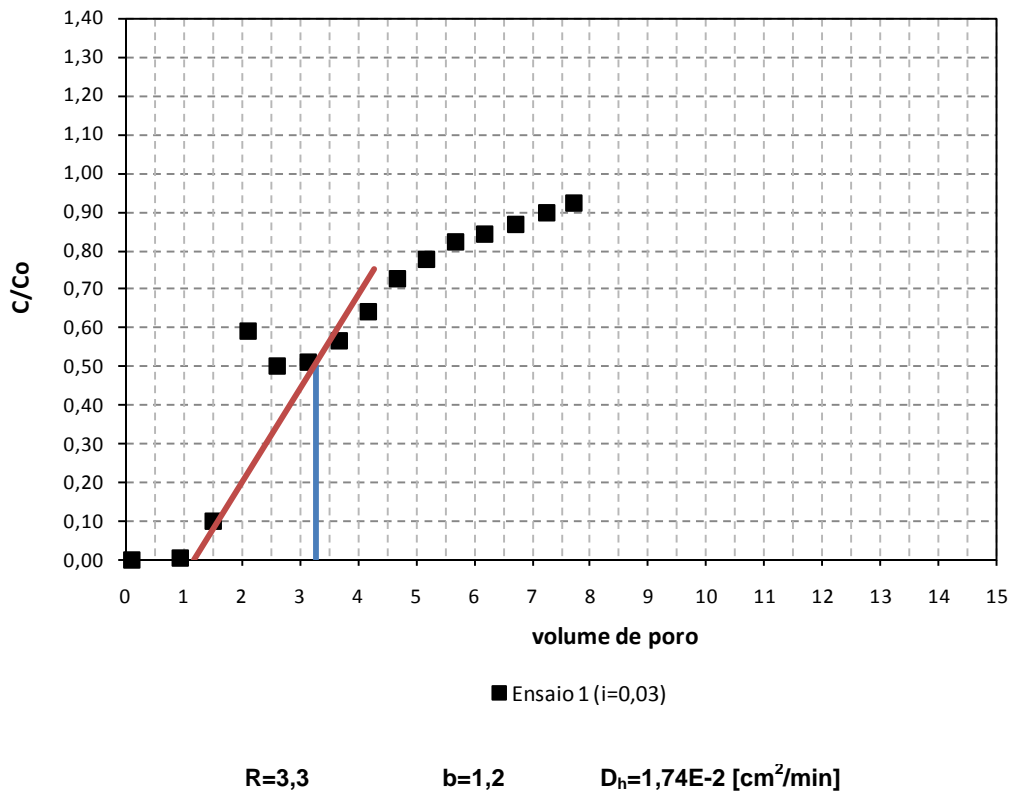
Co cel/ml = 1,31E+08

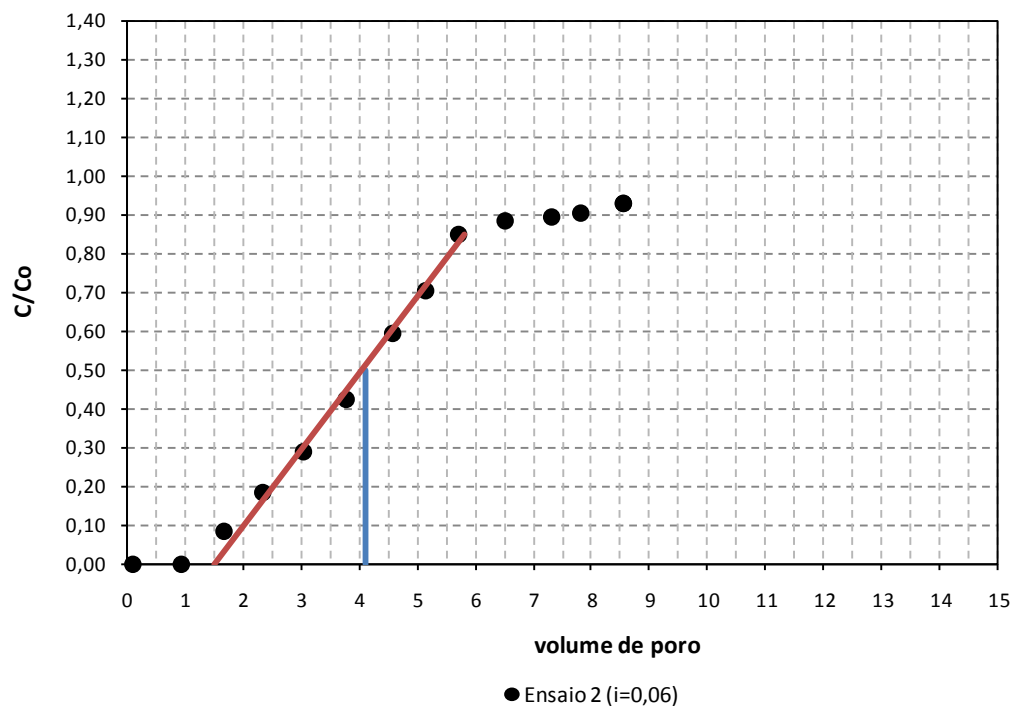
n= 0,28

N°	Absorbância [A]	N° cel/ml	C [cel/ml]	C/Co	vol percolado medido	pV	C [cel/ml] CNB	C/Co
0	0,005	-2,95E+06	0,00E+00	0,00	15,0	0,1	4,00E+05	0,00
1	0,029	2,87E+06	2,87E+06	0,02	220,0	1,2		0,00
2	0,033	3,83E+06	3,83E+06	0,03	395,0	2,2	5,30E+06	0,05
3	0,049	7,71E+06	7,71E+06	0,06	565,0	3,2		0,00
4	0,072	1,33E+07	1,33E+07	0,10	725,0	4,1	1,17E+07	0,11
5	0,100	2,01E+07	2,01E+07	0,15	880,0	5,0		0,00
6	0,139	2,95E+07	2,95E+07	0,22	1033,5	5,9		0,00
7	0,178	3,90E+07	3,90E+07	0,30	1175,5	6,7		0,00
8	0,206	4,58E+07	4,58E+07	0,35	1305,5	7,4	3,53E+07	0,35
9	0,242	5,45E+07	5,45E+07	0,41	1430,5	8,1		0,00
10	0,282	6,42E+07	6,42E+07	0,49	1570,5	8,9		0,00
11	0,344	7,92E+07	7,92E+07	0,60	1740,5	9,9		0,00
12	0,394	9,13E+07	9,13E+07	0,70	1900,5	10,8	6,65E+07	0,66
13	0,433	1,01E+08	1,01E+08	0,77	2060,5	11,7		0,00
14	0,485	1,13E+08	1,13E+08	0,86	2230,5	12,6	8,50E+07	0,84
15	0,532	1,25E+08	1,25E+08	0,95	2345,5	13,3		0,00
16	0,586	1,38E+08	1,38E+08	1,05	2460,5	13,9	1,20E+08	1,18
17	0,603	1,42E+08	1,42E+08	1,08	2575,5	14,6	1,29E+08	1,27

B.2. Determinação gráfica dos parâmetros “b” e “R”

Nesta seção apresentam-se as gráficas das curvas de chegada obtidas durante os ensaios ADS, indicando a forma como foi determinado o fator de retardamento R, assim como também o valor de b para posterior calculo da dispersão hidrodinâmica D_h .

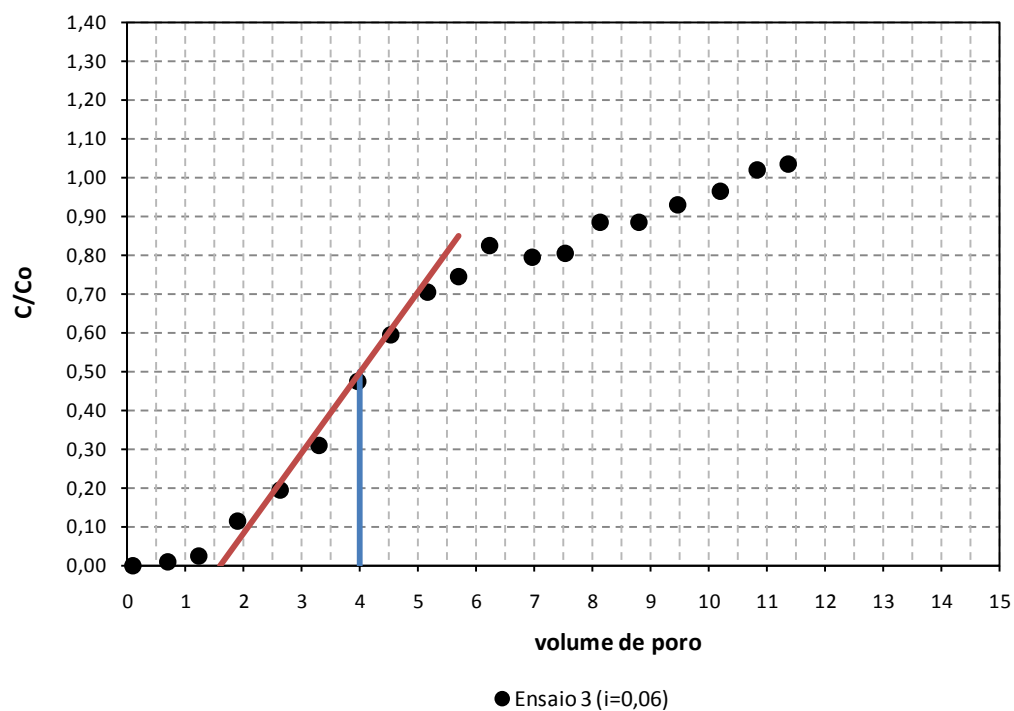




R=4,1

b=1,5

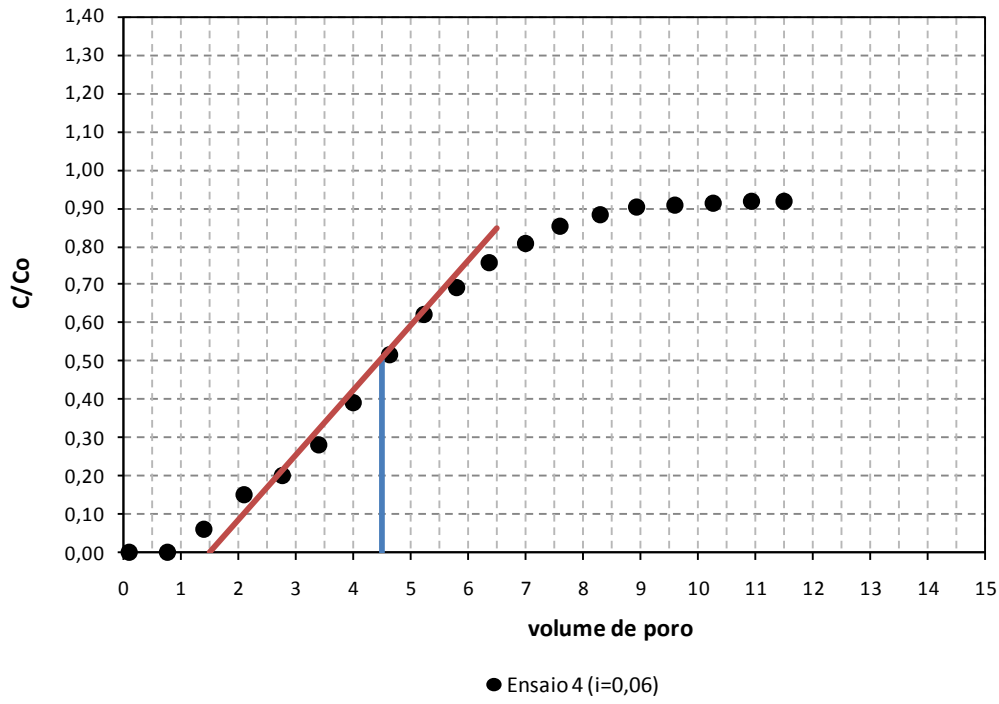
$D_h=2,04E-2$ [cm²/min]



R=4,0

b=1,6

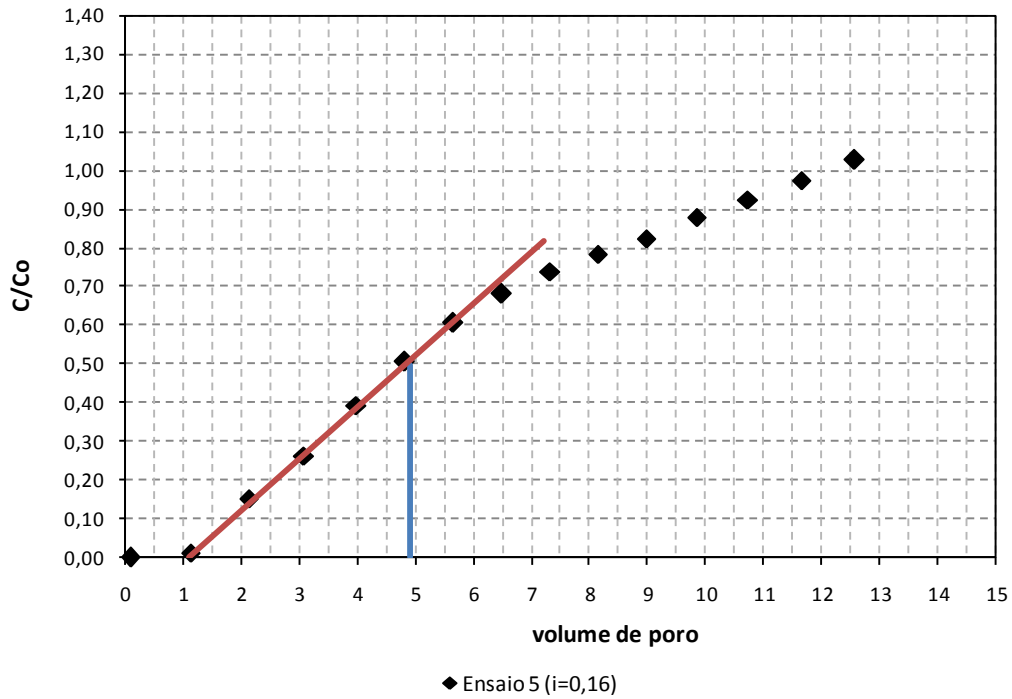
$D_h=1,63E-2$ [cm²/min]



R=4,5

b=1,5

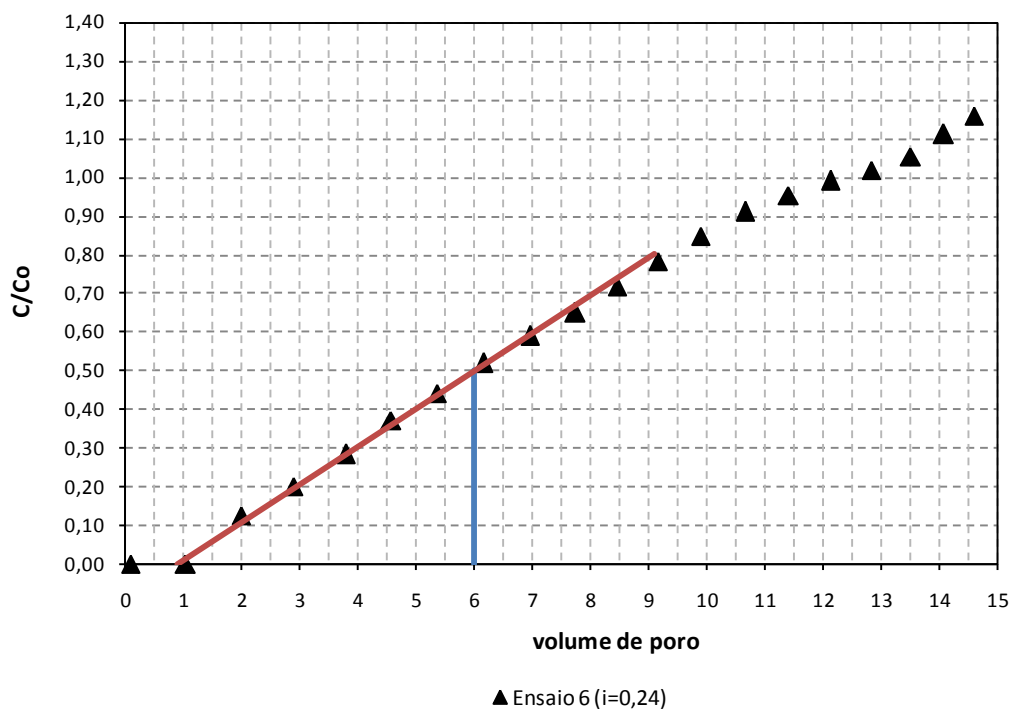
$D_h=1,44E-2$ [cm²/min]



R=4,9

b=1,1

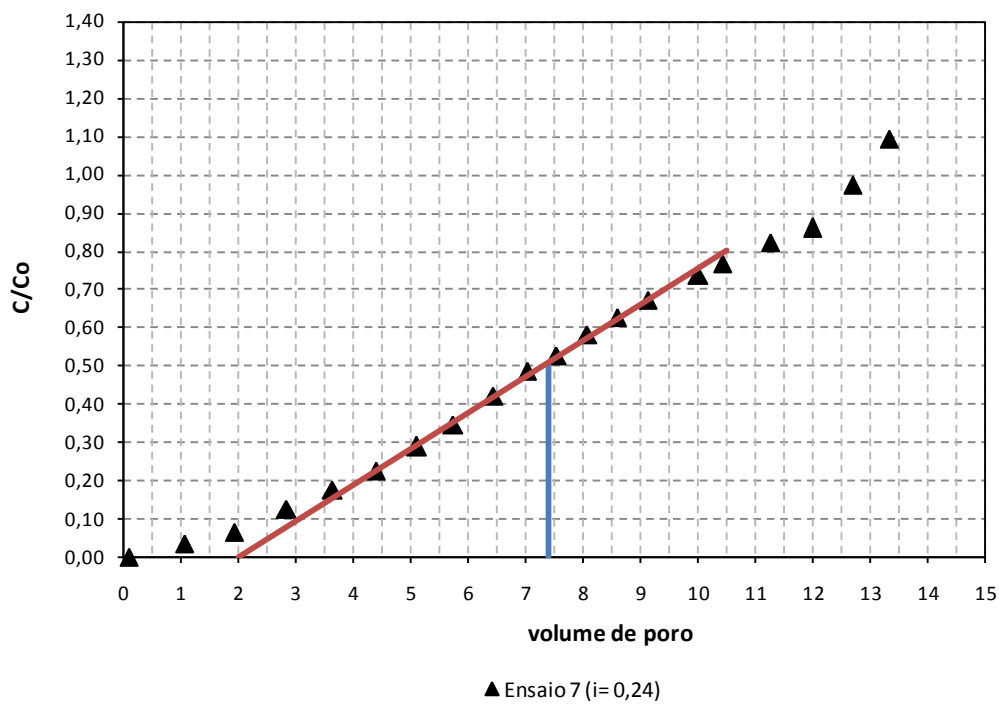
$D_h=4,87E-2$ [cm²/min]



R=6,0

b=0,9

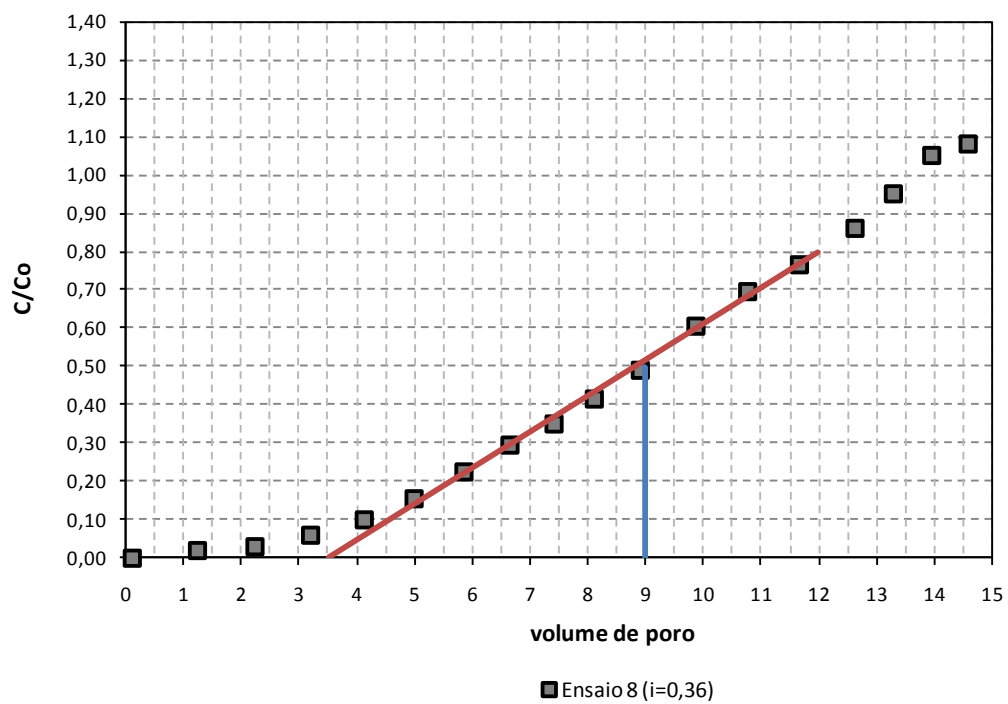
$D_h=5,47E-2$ [cm²/min]



R=7,4

b=2,0

$D_h=9,39E-3$ [cm²/min]



R=9,0

b=3,5

$D_h=7,89E-3$ [cm²/min]