Supplementary Material

Sorptive removal of Remazol Brilliant Blue R from aqueous solution by diethylenetriamine functionalized magnetic macro-reticular hybrid material

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Table SM1: Kinetics models and their linear forms

Kinetic model	Non-Linear form	Linear form	Plot
Pseudo-First order	$q_t = q_e\,[1 - e^{-k_1 t}]$	$\log(q_e - q_t) = \log q_e - (\frac{k_1}{2.303})\,t$	$\log(q_e - q_t)$ *vs.* t
Pseudo-Second order	$q_t = \frac{k_2 t}{1 + k_2 q_e t}$	$\frac{t}{q_t} = \frac{1}{k_2 q_e^2} + (\frac{1}{q_e})\,t$	(t/q_t) *vs.* t
Intraparticle diffusion	-	$q_t = K_i t^{0.5} + X$	q_t *vs.* $t^{0.5}$
Elovich equation	$\frac{dq_t}{dt} = \alpha e^{-\beta q}$	$q_t = \frac{1}{\beta}\ln\alpha\beta + \frac{1}{\beta}\ln t$	q_t *vs.* lnt

Table SM2: Sorption isotherms and their linear forms

Isotherm	Non-Linear form	Linear form	Plot
Langmuir	$q_e = \frac{q_{m,L}\, K_L\, C_e}{1 + K_L\, C_e}$	$\frac{C_e}{q_e} = \frac{C_e}{q_{m,L}} + \frac{1}{K_L\, q_{m,L}}$	$\frac{C_e}{q_e}$ *vs.* C_e
Freundlich	$q_e = K_F\, C_e^{1/n}$	$\ln q_e = \ln K_f + \frac{1}{n} \ln C_e$	$\ln q_e$ *vs.* $\ln C_e$
Dubinin–Radushkevich	$q_e = Q_{DR} e^{-K_{DR}\varepsilon^2}$	$\ln q_q = \ln Q_{DR} - K_{DR}\varepsilon^2$	$\ln q_e$ *vs.* ε^2
Temkin	$q_e = \frac{RT}{b_T}[\ln(A_T C_e)]$	$q_e = (\frac{RT}{b_T}) \ln A_T + (\frac{RT}{b_T}) \ln C_e$	q_e vs. $\ln C_e$

Figures captions

Figure SM1: FT-IR spectra of the MCGMA macro-reticular sorbents.

Figure SM2: Removal % of RBBR by MCGMA-I and MCGMA-II as a function of pH.

Figure SM3: Modeling of uptake kinetics with: (a) PFORE, (b) PSORE.

Figure SM4: Modeling of uptake kinetics with (a) simplified model of resistance to intraparticle diffusion (Morris and Weber equation), (b) Elovich equation.

Figure SM5: Linearized plots for sorption isotherms: (a) Langmuir equation, (b) Freundlich equation.

Figure SM6: Linearized plots for sorption isotherms: (a) Dubinin–Radushkevich equation, Temkin model.

Figure SM7: van't Hoff plots for RBBR adsorption onto the MCGMA macro-reticular sorbents.

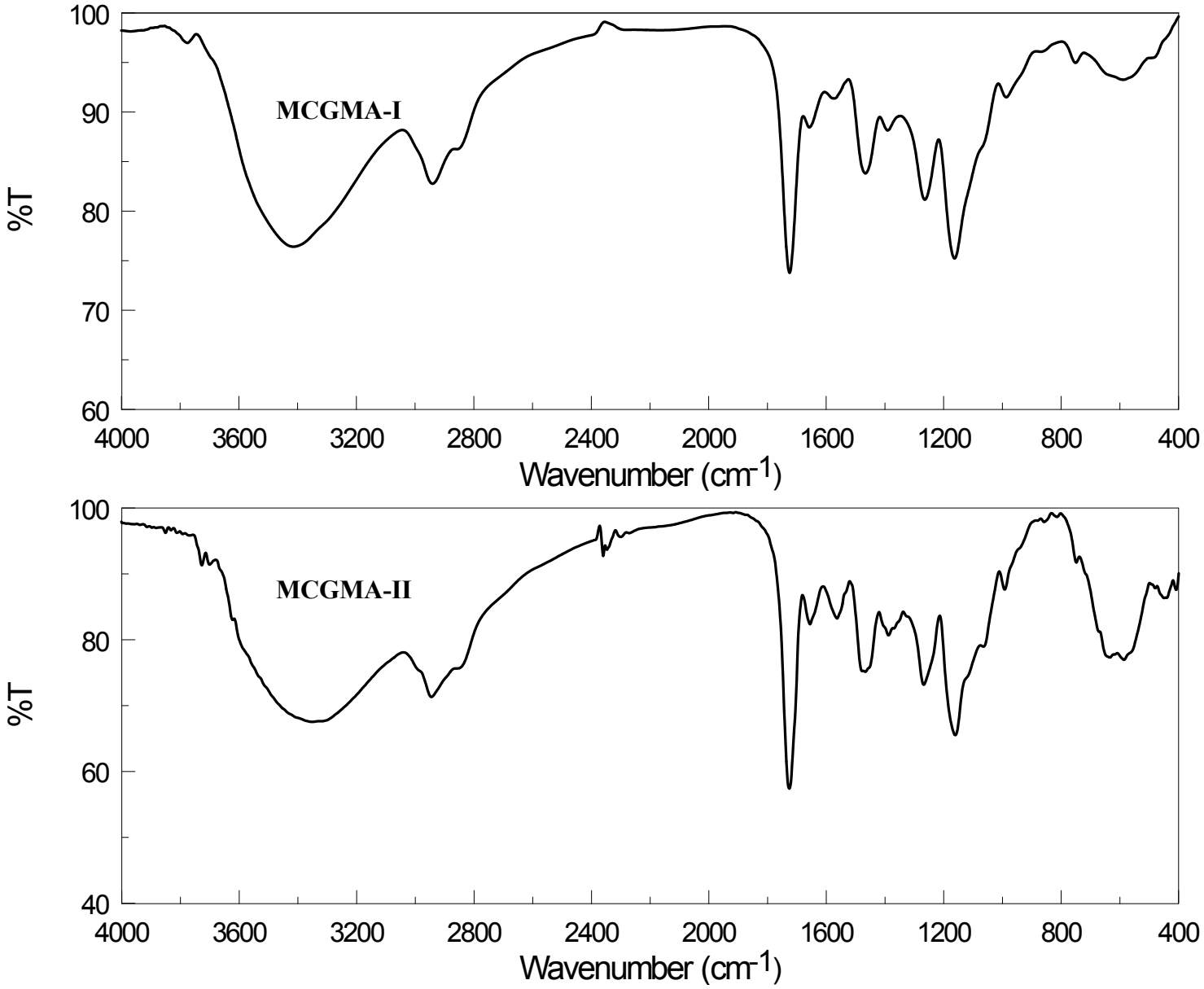
MCGMA-I
%T
100
90
80
70
60
4000
3600
3200
2800
2400
2000
1600
1200
800
400
Wavenumber (cm-1)
MCGMA-II
%T
100
80
60
40
4000
3600
3200
2800
2400
2000
1600
1200
800
400
Wavenumber (cm-1)

Figure SM1

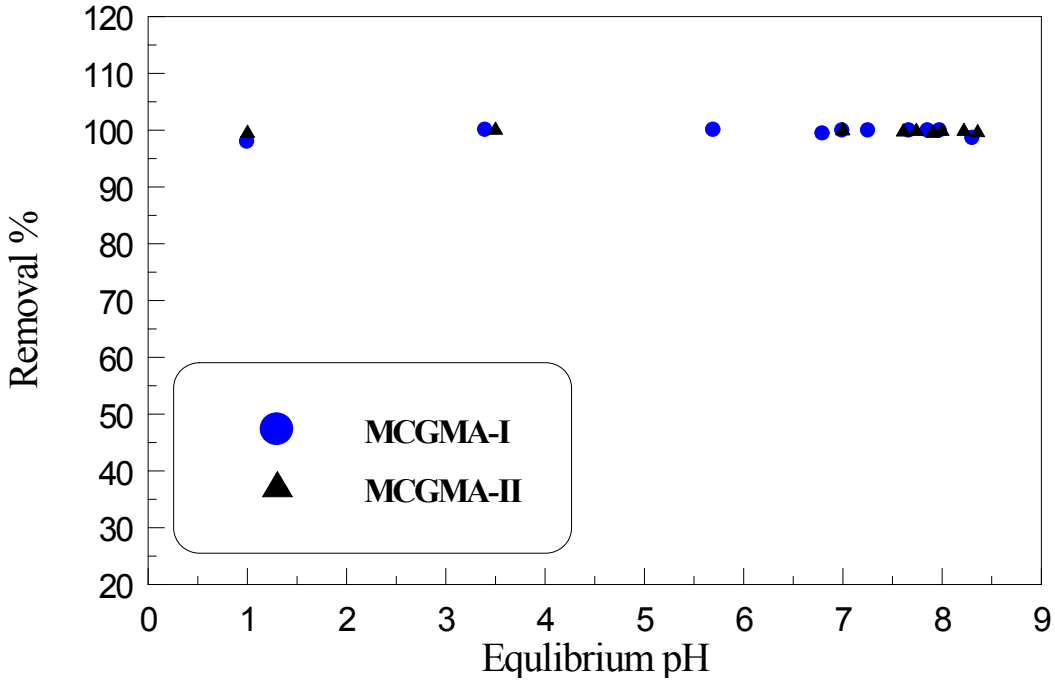
120
110
100
90
80
70
60
50
40
30
20
Removal %
0
1
2
3
4
5
6
7
8
9
Equlibrium pH
MCGMA-I
MCGMA-II

Figure SM2

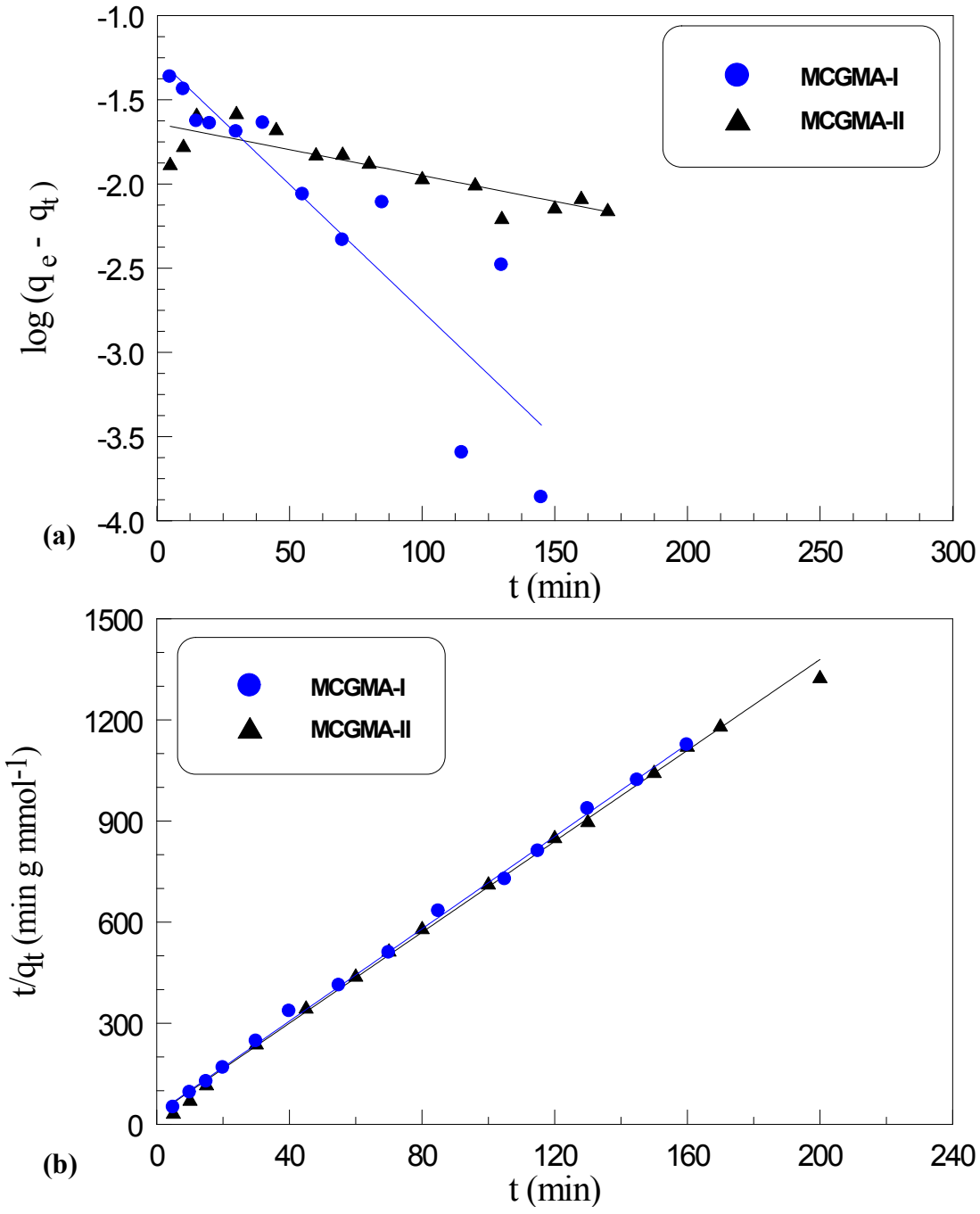
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
-4.0
log (q e - q t)
MCGMA-I
MCGMA-II
(a)
0
50
100
150
200
250
300
t (min)
1500
1200
900
600
300
0
t/qt (min g mmol-1)
MCGMA-I
MCGMA-II
(b)
0
40
80
120
160
200
240
t (min)

Figure SM3

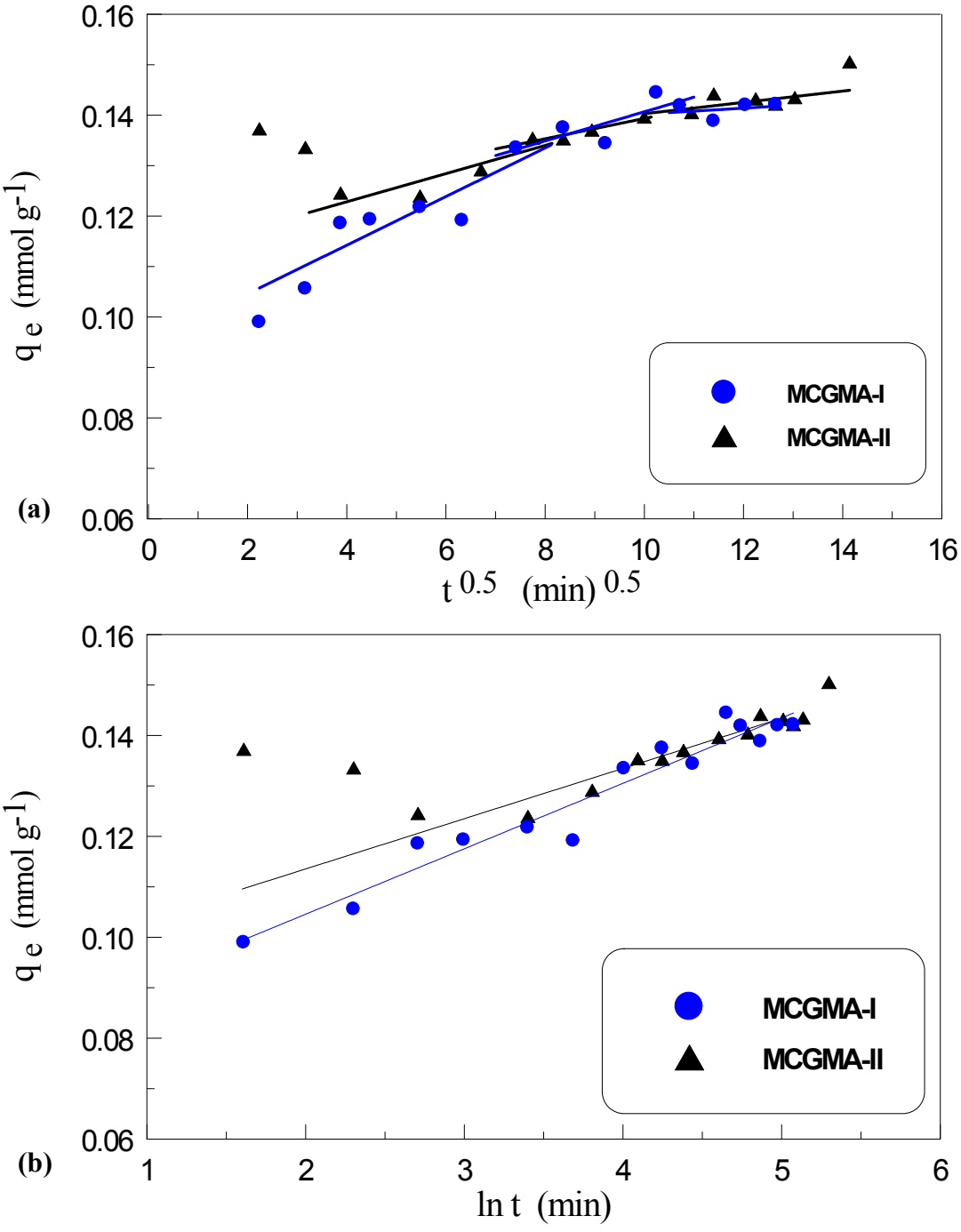
0.16
0.14
0.12
0.10
0.08
0.06
q e (mmol g-1)
(a)
0
2
4
6
8
10
12
14
16
t 0.5 (min) 0.5
MCGMA-I
MCGMA-II
0.16
0.14
0.12
0.10
0.08
0.06
q e (mmol g-1)
(b)
1
2
3
4
5
6
ln t (min)
MCGMA-I
MCGMA-II

Figure SM4

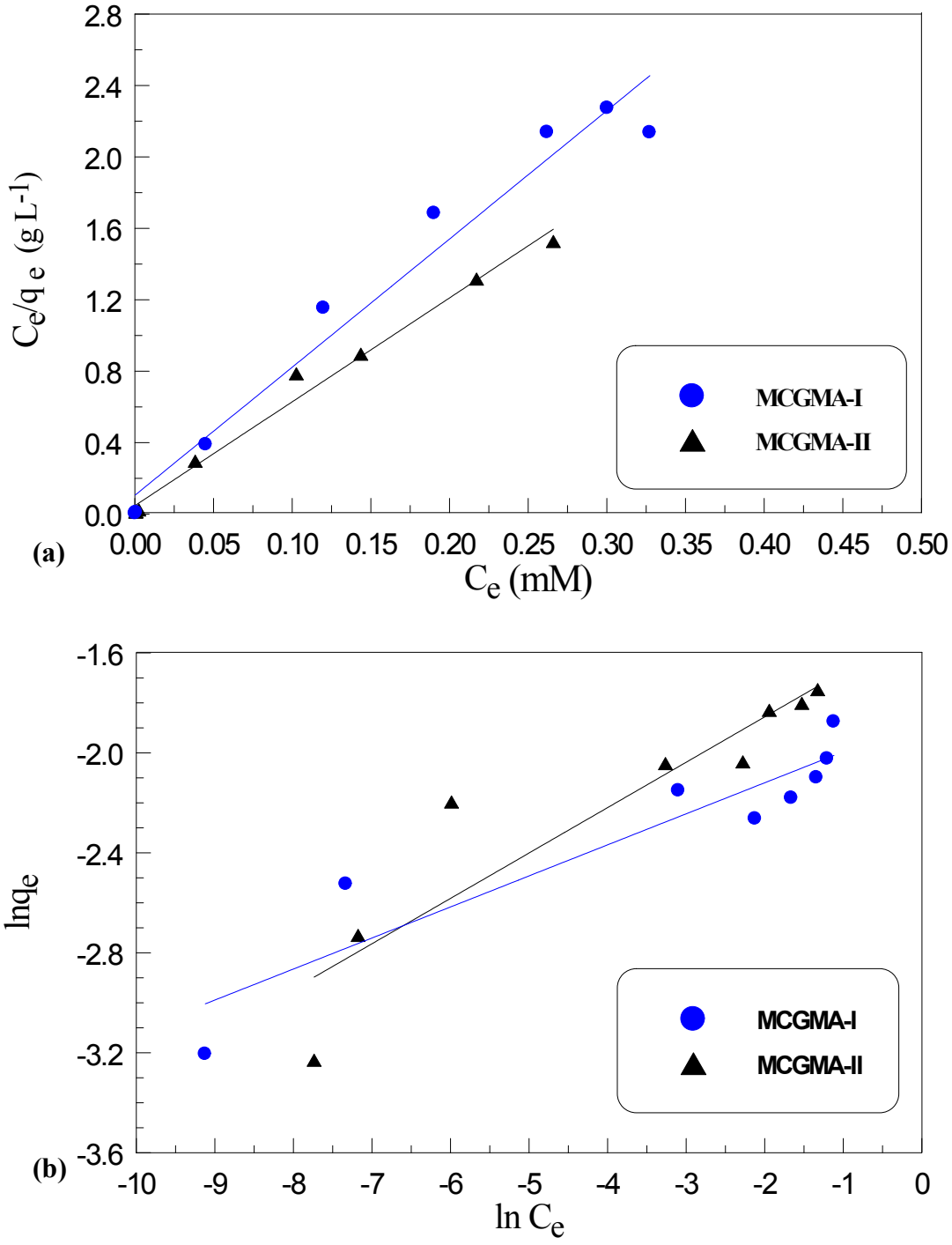
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
Ce/qe (g L-1)
0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50
Ce (mM)
MCGMA-I
MCGMA-II
(a)
-1.6
-2.0
-2.4
-2.8
-3.2
-3.6
lnqe
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0
ln Ce
MCGMA-I
MCGMA-II
(b)

Figure SM5

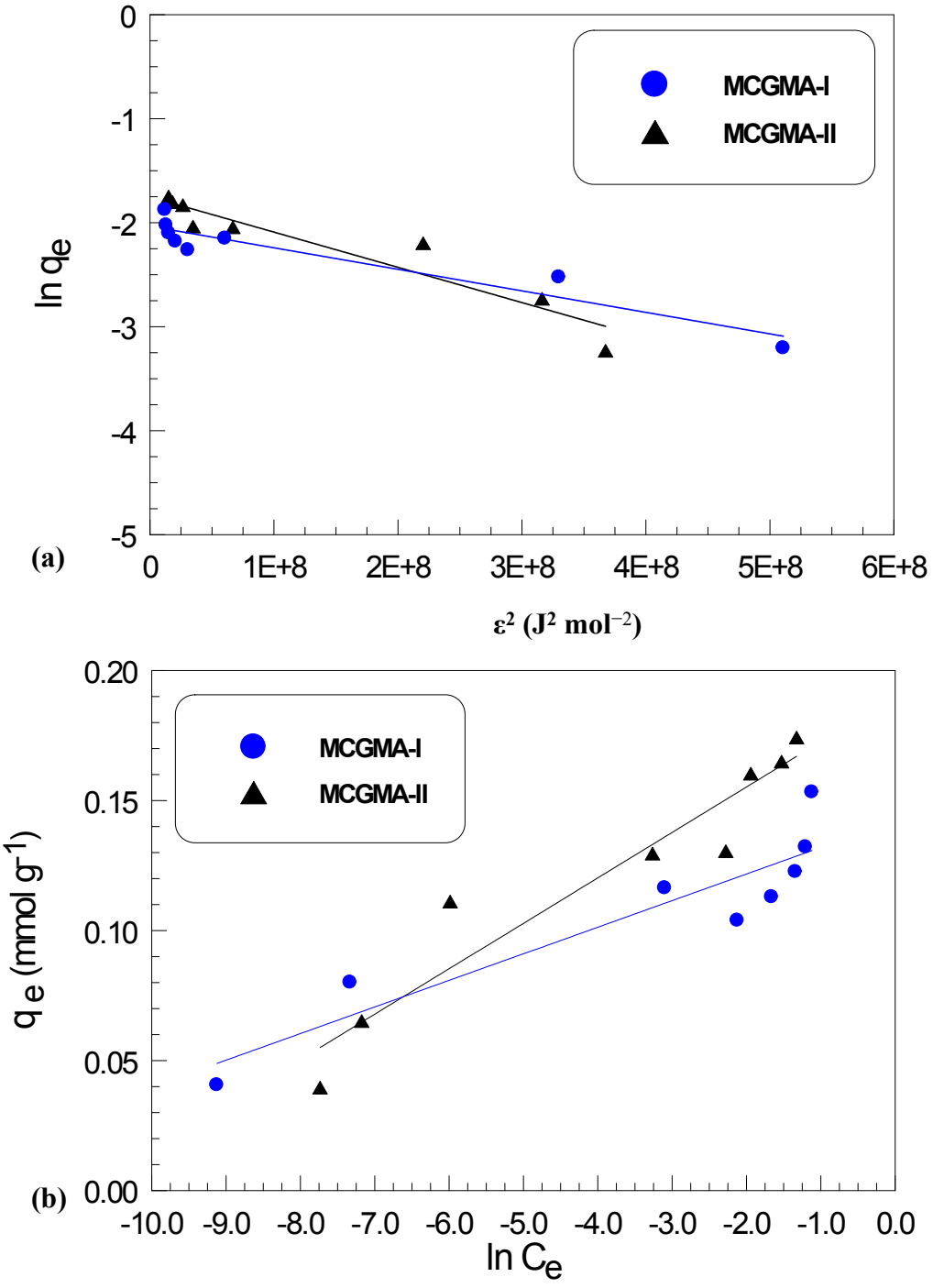
MCGMA-I
MCGMA-II
ln qe
ε² (J² mol⁻²)
(a)
0
-1
-2
-3
-4
-5
0
1E+8
2E+8
3E+8
4E+8
5E+8
6E+8
MCGMA-I
MCGMA-II
qe (mmol g-1)
ln Ce
(b)
0.20
0.15
0.10
0.05
0.00
-10.0
-9.0
-8.0
-7.0
-6.0
-5.0
-4.0
-3.0
-2.0
-1.0
0.0

Figure SM6

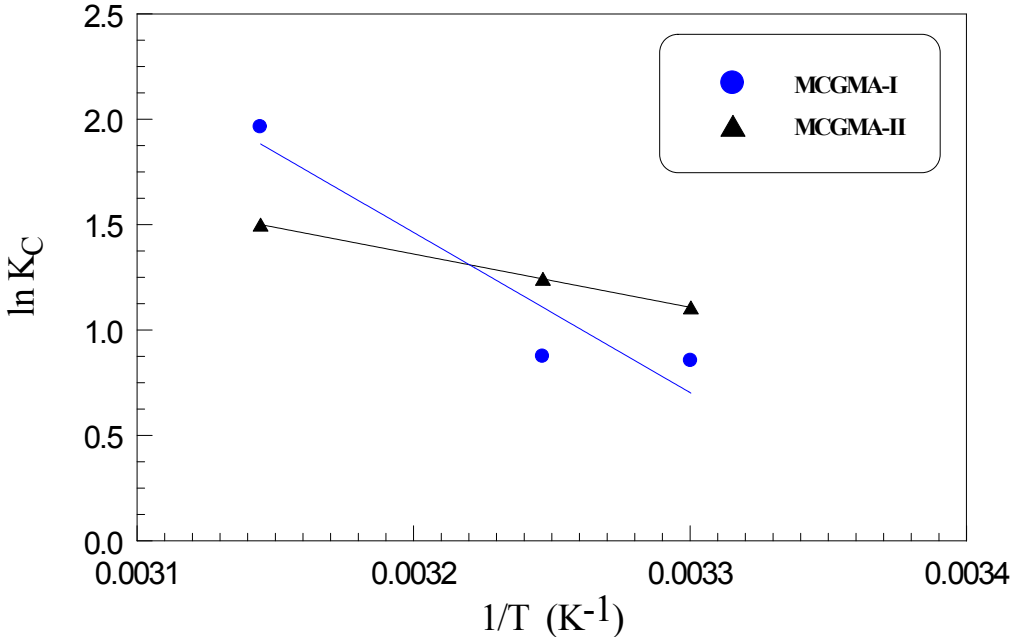
2.5
2.0
1.5
1.0
0.5
0.0
ln K_C
0.0031
0.0032
0.0033
0.0034
1/T (K-1)
MCGMA-I
MCGMA-II

Figure SM7