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### چکیده

(kPa) K  
Zeolite 13X و MCM فعال Eurocarbon Norit RB3

فعال با طول ۲۸(cm) و قطر ۱ به دست  
این

کربن

### واژه‌های کلیدی:

مقدمه

[ ]

[ ]

صنایع

CO<sub>2</sub>

[ ]

زایی

°C

[ ]

HTles

% -

[ ]

( ) .MCM .[ - ]

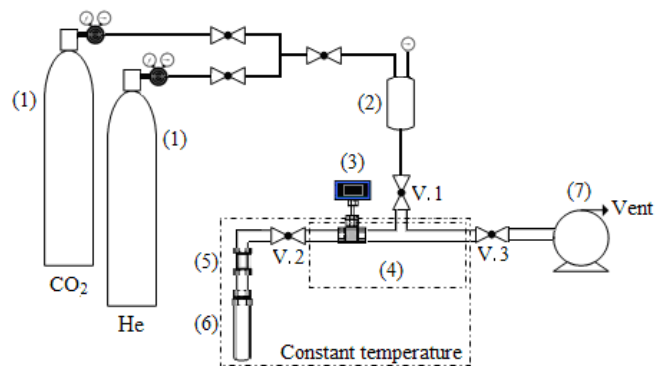
BET	
(m <sup>2</sup> /g) BET	
Norit RB3	1100
Eurocarbon	785
Zeolite 13X	730
MCM	908

[ - ]

مواد مورد استفاده

شرح روش آزمایش و دستگاه‌های اندازه‌گیری

[ ] ( )



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P=1.1 (atm) T=25(°C) q=150(ml/min)			
	CO <sub>2</sub> (vol%)	N <sub>2</sub> (vol%)	He (vol%)
Run 1	5.2	44.8	50
Run 2	8.4	41.6	50

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28(cm)

1(cm)

0.55

[ ] ( )

$$\frac{\partial \bar{q}}{\partial t} = k(q^* - \bar{q}) = kK(c - c^*) \quad (1)$$

0.49(g/cm<sup>3</sup>)

cylindrical

3(mm)

K (s<sup>-1</sup>)

$\bar{q}$

مدل دینامیک ارائه شده:

[ ] ( )

$$\frac{1}{kK} = \frac{R_p}{3k_c} + \frac{R_p^2}{15D_e} \quad (2)$$

m/s

k<sub>c</sub>

q

K

R<sub>p</sub> m<sup>2</sup>/s

D<sub>e</sub>

m

c mol/m<sup>3</sup>-adsorbent  
mol/m<sup>3</sup>

[ ] ( )

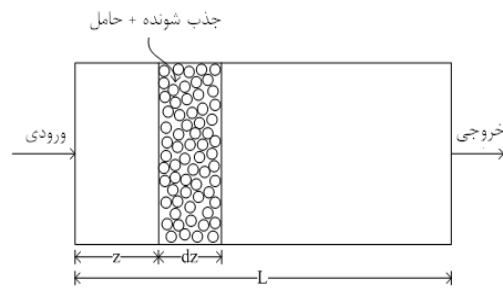
$$Sh = 2 + 1.1Re^{0.6}Sc^{1/3} \quad (3)$$

Re = D<sub>p</sub>ρu/μ

Sh = k<sub>c</sub>D<sub>p</sub>/D<sub>i</sub>

Sc = μ/ρD<sub>i</sub>

( )



( )

dz

( ) dt

$$\frac{c}{c_F} \approx \frac{1}{2} \left[ 1 + \operatorname{erf} \left( \sqrt{\tau} - \sqrt{\xi} + \frac{1}{8\sqrt{\tau}} + \frac{1}{8\sqrt{\xi}} \right) \right] \quad (4)$$

$$-D_1 \frac{\partial^2 c}{\partial z^2} + \frac{\partial(uc)}{\partial z} + \frac{\partial c}{\partial t} + \frac{(1-\epsilon_b)}{\epsilon_b} \frac{\partial \bar{q}}{\partial t} = 0 \quad (5)$$

$$\xi = (kKZ / u)((1 - \epsilon_b) / \epsilon_b)$$

$$\text{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-\eta^2} d\eta$$

$$\text{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-\eta^2} d\eta \quad ( )$$

$$K \quad ( )$$

K

$$l \quad ( ) \quad ( )$$

$$\alpha_{CO_2, N_2} = \left( \frac{q_i}{q_j} \right) \left( \frac{y_j}{y_i} \right) \quad ( ) \quad ( )$$

### بحث و بررسی نتایج

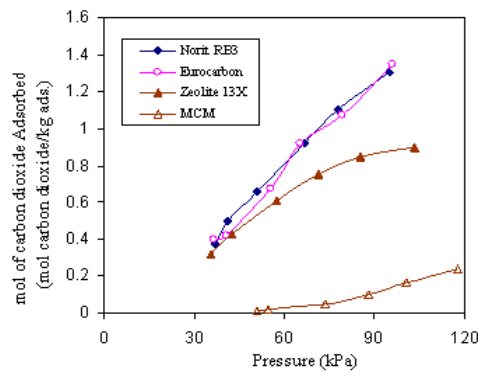
$y_i$   
 $q_i$  (mol/m<sup>3</sup>)  
°C - (kPa)  
( )

Zeolite 13X

( ) ( )

MCM

[ ]



°C - (kPa)

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( ) .....

$$\min f(k) = \sum \left[ \left( \frac{c}{c_F} \right) - \left( \frac{c}{c_F} \right)_{\text{experimental}} \right]^2 \quad ( )$$

( )

:[ ]

$$S_y = \sqrt{\frac{\sum_{i=1}^n \left( \left( \frac{c_i}{c_F} \right) - \left( \frac{c_i}{c_F} \right)_{\text{experimental}} \right)^2}{n-1}} \quad ( )$$

( )  $S_y$

$D_e$

/ - /  $S_y$

( )

$S_y$	0.2
K	22
k	$2.05 \times 10^{-2} \text{ (s}^{-1}\text{)}$
$k_e$	$2.68 \times 10^{-2} \text{ (m/s)}$
$D_e$	$6.82 \times 10^{-8} \text{ (m}^2\text{/s)}$

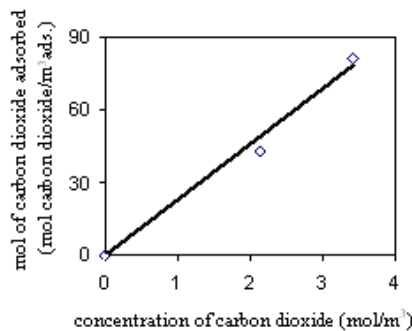
$S_y$

### تقدیر و تشکر

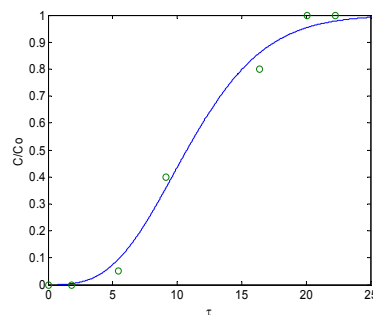
Chafa

(q <sub>i</sub> ) (mol/m <sup>3</sup> )	(y <sub>i</sub> )
/	/
/	/
/	/
/	/

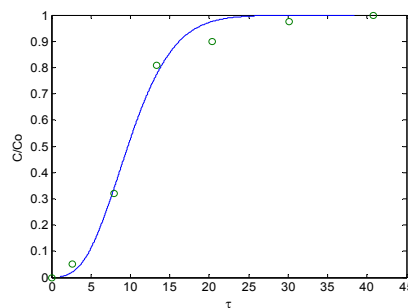
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شکل ۴. منحنی همدمای تعادلی جذب سطحی دی اکسید کربن بر روی کربن فعال، فشار ۱/۲ اتمسفر و دمای ۲۵ °C



شکل ۵. منحنی شکست دی اکسید کربن ۵/۲ درصد، فشار ۱/۲ اتمسفر و دمای ۲۵ °C



/ / °C

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