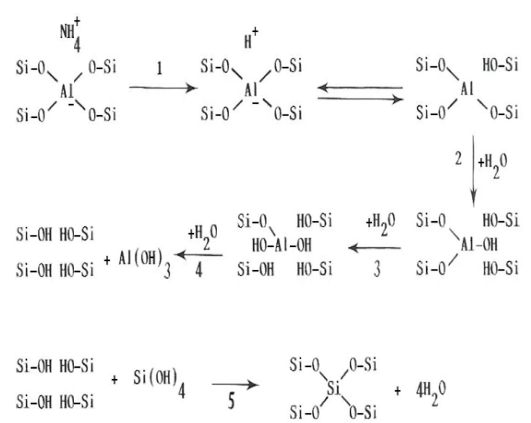
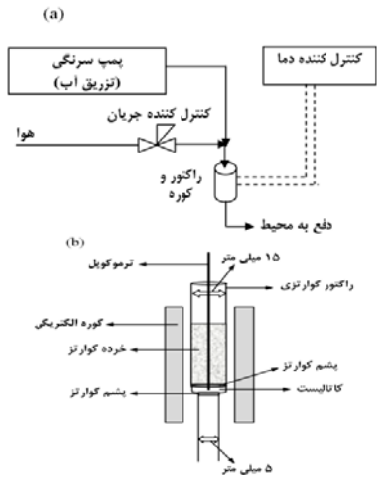




[ ]  
 Y  
 Si/Al Si/Al Si- °C  
 O-Al  
 [ ]  
 (XRF)  
 (XRD) (SEM)  
 (BET) Y  
 / Si/Al Y  
 [ ]  
 ()  
 ) Y  
 :(  
 / Na<sub>2</sub>O: Al<sub>2</sub>O<sub>3</sub>: SiO<sub>2</sub>: H<sub>2</sub>O ()  
 (Merck)  
 (Riedel-de Haën)  
 (Merck)  
 )  
 () () ( °C  
 :  
 / Na<sub>2</sub>O: Al<sub>2</sub>O<sub>3</sub>: SiO<sub>2</sub>: H<sub>2</sub>O ()  
 ()  
 :  
 / Na<sub>2</sub>O: Al<sub>2</sub>O<sub>3</sub>: SiO<sub>2</sub>: H<sub>2</sub>O ()  
 PTFE





$\text{Na}_2\text{O}:\text{Al}_2\text{O}_3:\text{H}_2\text{O}$   
 $\text{Na}_2\text{O}:\text{Al}_2\text{O}_3:\text{SiO}_2:\text{H}_2\text{O}$  ( )

°C  
 °C  
 °C  
 pH  
 NaY  
 (Merck)  
 °C  
 (AA)

(XRD)

Y  
USY

$\text{CuK}\alpha_2$  ) X'Pert mm  
 $\theta$  ( $\lambda =$  /  
 (CR) / °/min . ( ) PID  
 (a<sub>0</sub>)  
 ASTM D3942 ASTM D3906  
 ( ) ( ) ( ) ( ) /

XRD

( ) [ ] (USY) Y  
 :Si/Al= / °C/min  
 $N_{\text{Al}} =$  / (a<sub>0</sub> / ) ( )  
 ( ) [ ] °C  
 Si/Al= /

( ) ( )

$N_{Al} = \frac{1}{a_0} \left( \frac{1}{a_0} \right)$  ( )

(BET)

Si/Al= /

(Quantachrome) CHEMBET-3000

Si/Al= /

°C

% N<sub>2</sub>/He

Y :

Si/Al= /

Y zeolite (Si/Al=1.69)	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>
Wt%	22.50	44.66

(TCD)

Y :

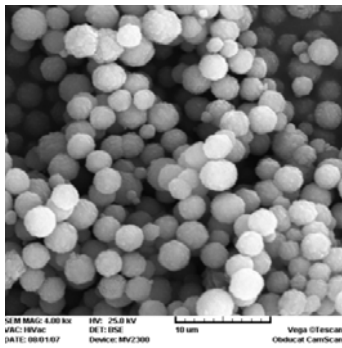
Si/Al= /

Y zeolite (Si/Al=2.44)	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>
Wt%	15.38	44.39

(SEM)

CAMSCAN MV2300 SEM

(Instruments Oxford)



Y :

Si/Al=1.69

(XRF)

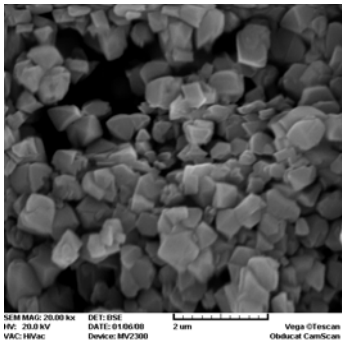
SiO<sub>2</sub>

XRF

Al<sub>2</sub>O<sub>3</sub>

XRD XRF

(PHILIPS) PW2404



Y :

Si/Al=2.44

(XRF)

Y

( ) ( )

(Al<sub>2</sub>O<sub>3</sub>)

(SiO<sub>2</sub>)

XRF

Y

Si/Al

/

Si/Al

Y

/

(SEM)

°C

°C

( ) ( ) . ( ) . ( )  
 ( ) ( ) . XRD  
 ( )

NH<sub>4</sub>NaY

Si/Al= /

USY2 USY1

H<sup>+</sup>

/ Si/Al

Si/Al

( )

[ ]

Y

FCC

Y

Y

[ ]

USY3

/

Si/Al

USY8

NH<sub>4</sub><sup>+</sup> Na<sup>+</sup> H<sup>+</sup>  
[ ]

Si-O-Al

/ Si/Al

/ Si/Al

Y

Si/Al

/ /

[ ]

Si/Al

/ Å Si-O

/ Å Al-O

Si/Al

Y

( ) ( )

:

Sample	Liquid water flow (ml/hr)	Final temperature (°C)	Steaming time at final temperature (min)
USY1	26.8	475	60
USY2	26.8	600	60
USY3	26.8	600	30
USY4	26.8	600	60
USY5	2.6	600	60
USY6	26.8	700	30
USY7	26.8	700	60
USY8	2.6	700	60

Y

:

Sample	N <sub>Al</sub>	Si/Al (Atomic ratio)	C <sub>R</sub> (%)	a <sub>0</sub> (Å)
NH <sub>4</sub> NaY(Si/Al=1.69)	71	1.69	100	24.8
NH <sub>4</sub> NaY(Si/Al=2.44)	56	2.44	100	24.76
USY1	47	3.1	16	24.6
USY2	---	---	Amorphous	---
USY3	34	4.7	85	24.55
USY4	21	8.1	81	24.43
USY5	42	3.6	83	24.63
USY6	23	7.3	68	24.45
USY7	14	12.3	68	24.37
USY8	27	6.2	78	24.49

XRD

( )

NH<sub>4</sub>NaY

θ

θ

/

( )

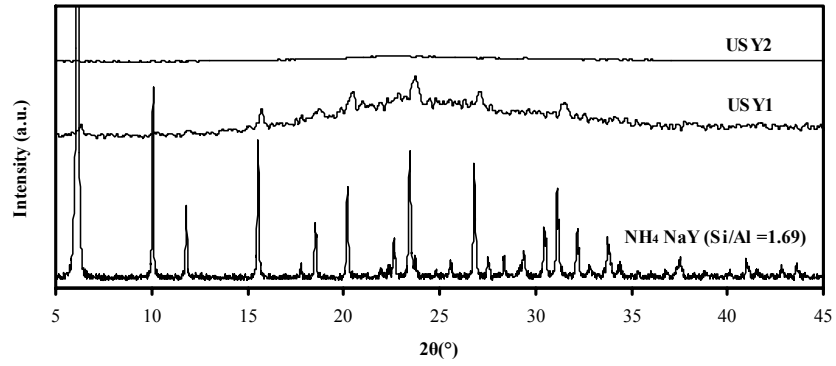
( )

Si/Al

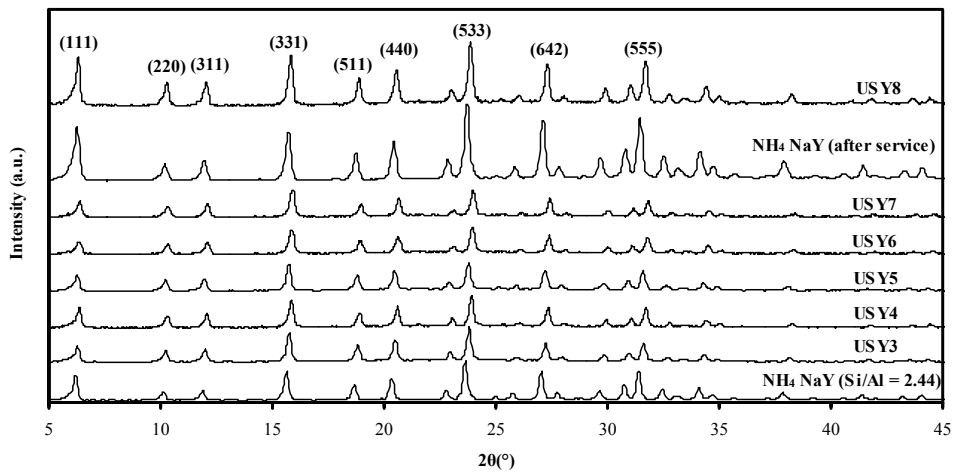
/

USY8

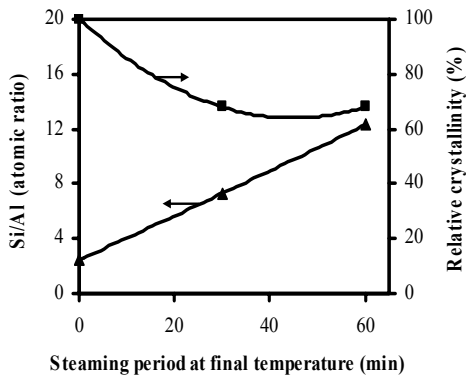
. [ ]



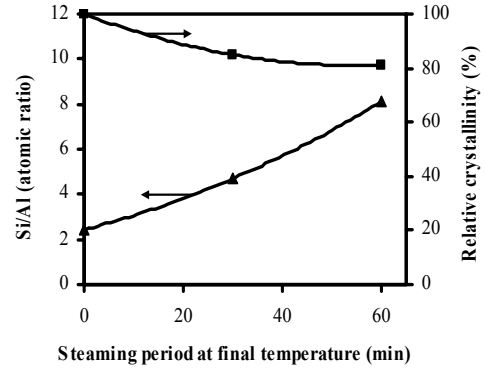
USY2 USY1 Si/Al=1.69 Y :



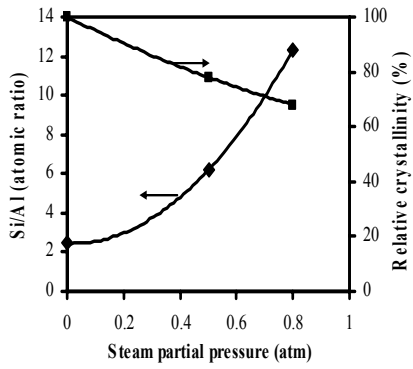
USY8 USY3 Si/Al=2.44 Y :



Si/Al :  
700 °C  
Si/Al = 2.44 0.8



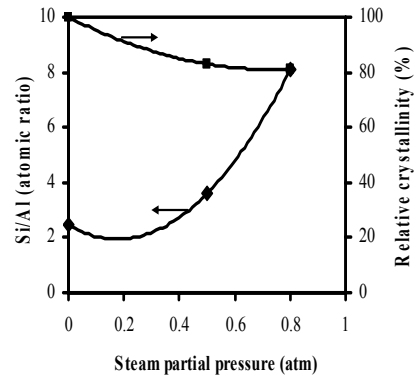
Si/Al :  
600 °C  
Si/Al=2.44 0.8



Si/Al : :

700 °C

Si/Al = 2.44



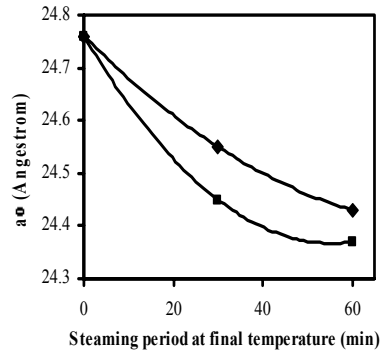
Si/Al : :

600 °C

Si/Al = 2.44

BET : :

Sample	SSA (m <sup>2</sup> /g)
Y zeolite(Si/Al=1.69)	800
USY1, USY2	Major loss of crystallinity
Y zeolite(Si/Al=2.44)	748
USY3	667
USY4	630
USY6	600
USY7	602



(a<sub>0</sub>) : :

(■) 700 °C (◆) 600 °C

Si/Al = 2.44 0.8

Si/Al

Si/Al

Y

Y

Y

Si/Al

Si/Al

Y

Y



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