

() , ()

*

(// : // :)

() B () A
E%
)
B (

.(Chen, 1995)

(Banerjee et al., 1996; Buonoere et al., 2002; Cha & chinnan, 2004;
Khwaldia et al., 2004b; Khwaldia et al., 2004a; Schou et al., 2004)
(Buonoere et al., 2002; Avena-Bustillos & Krochta, 1993)

.(Chen, 2009; Chick & Ustunol)

(Banerjee et al., 1996; Buonoere et al., 2002; Khwaldia et al., 2004a; Schou et al., 2004)

(Chen, 1995; Chick & Ustunol, 1998; Guilbert et al, 1996; Khwaldia et al., 2004b)

atefe_borumand@ut.ac.ir : *

1 . Biodegradable

()

(Chick & Hernandez, 2002)

(Avena-Bustillos & Krochta, 1993; .

Chen, 2002; Chick & Ustunol, 1998; Garcia et al., 2004;

Chick & Hernandez, 2002; Khwaldia et al., 2004b;

Krochta & Mchagh, 1996)

Avena- bustillos & Krochta

pH

(WVP¹)

°C

(pH) / pH

pH = /

()

() A

/ /)

()

(Gly/pro=0.36)

() ± °C

C

() ± °

(

(Longares et al., 2005)

(2002) Chick & Hernandez

()

/ ± °C

1 . Water Vapor Permeability

2 . Composite

3 . Maximum Load

4 . Carnauba

(Broumand, 2008) (B) /

(scanning electron microscope (SEM)) /

(TS) (E) (Broumand, 2008)

(YM) (E)

() / ()

(Longares et al., 2005)

(E) (TS) () ()

(ASTM-D-882-3) ()

Testo metric, M350-10CT- SER NO : 2344 - ()¹HLB
 () ROCHDALE.ENGLAND

± () ± °C ± °C

Kg

mm mm

mm/s mm °C ()

(IKA® RCT basic)

(IKA T25-digital ultra turax)

(± °C

(Avena-Bustillos & Krochta, 1993; Chick & Hernandez, 2002; Schou et al., 2004)

(ml)

(± °C (/ ×)

() /

2. Scanning Electron Microscope (SEM)
 3. Tensile Strength (TS)
 4. Elongation (E)
 5. Elongation at Break
 6. Young's Modulus
 7. Rupture

()

(g s⁻¹)

(m²)

(g

:

Pa⁻¹ s⁻¹ m⁻¹)

$$WVP = [WVTR/S (R1-R2)] d$$

()

(Pa)

S

R2

R1 (°C)

(Garcia et al., 2004)

(m)

d



()

(Mitutoyo, LIC.

NO. 689037-Japan)

) /

(HLB)

ASTM(1995-method E96)

/ m²

()

°C

(

(RH=0%)

)

(

()

()

HLB

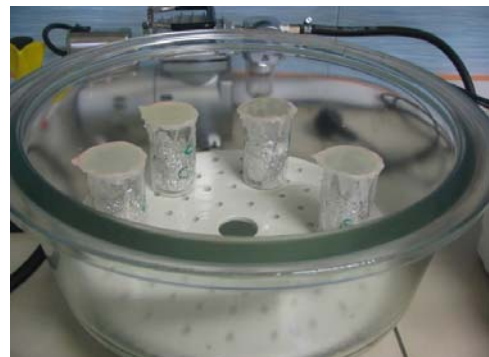
/)

(WVTR)

(r²>

(Broumand, 2008)

- 1 . Water Vapor Permeability (WVP)
- 2 . Water Vapor Transport
- 3 . Water Vapor Transmission Rate (WVTR)



() ± °C

± °C
± °C
± °C
± °C
± °C

(A)

)

(

.(Chen, 1995; Mohsenin, 1986)

a

A

.() B

B

/ /

B

(mL)

A

B

A

B

)

()

B (

A

.(Avena- Bustillos & Krochta, 1993;

Chen, 2002)

.(b)

B

()

)

B

(b



(A)

(B)

.(Chen, 1995)

()

- 3 . Yield strength
- 4 . Maximum Stress
- 5 . Plasticizer

- 1 . Tensile Properties
- 2 . Tensile Stress

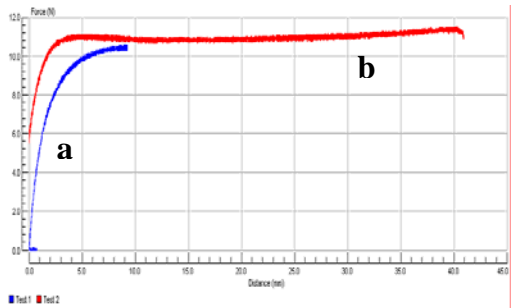
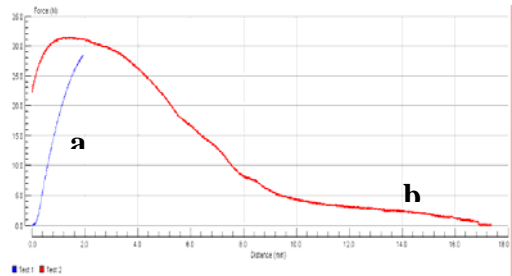
, ()

.(Chen, 1995, Chen, 2002)

.(Chen, 1995)

(...)

(Chen, 2002; Khwaldia et al., 2004; Krochta & Mchagh, 1996)



B

(E%)

()

.(Chen, 2002; Chick & Hernandez, 2002)

E%

)

.(

.(Chen, 2002)

) A

) B (

(Chick & Hernandez, 2002; Chen, 1995; Avena-Butillos & Krochta, 1993)

A (

.()

(YM) ()

4 . Composite Films
5 . Lubricant

1 . Smooth
2 . Tough
3 . Maximum force

()

(Mohsenin, 1986)

B

A

(1993) Avena-Bustillos & Krochta .

A

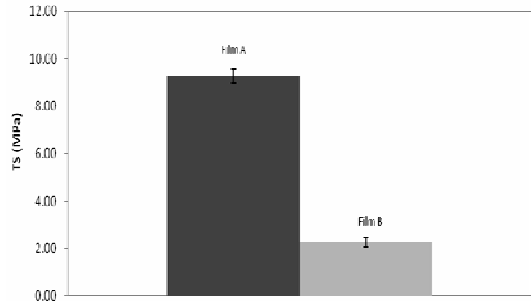
(Cha &

.Chinnan, 2004)

Chick & .(Banerjee et al., 1996)

(2002) Hernandez

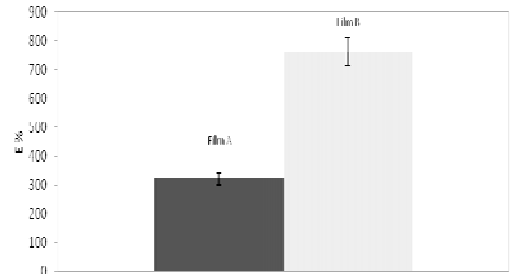
.(Chick & Hernandez, 2002)



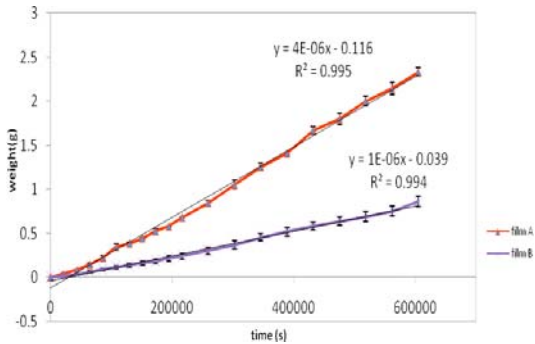
B () A (TS)
()

(Banerjee et al., 1996; Chen, 1995;

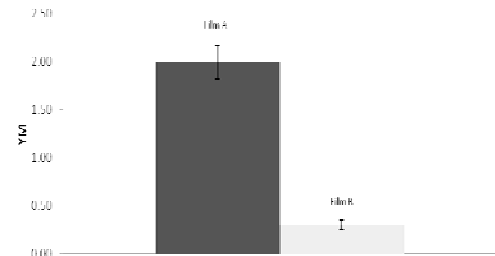
.Krochta & Mchagh, 1996)



() A (E%)
() B



(B) (A)



B () A (YM)
()

) ()
) (

) B

() A (

A

1 . Stiffness

(Chick & Hernandez, 2002; Avena-

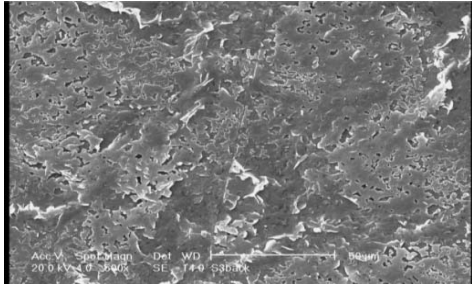
B

Bustillos, 1993)

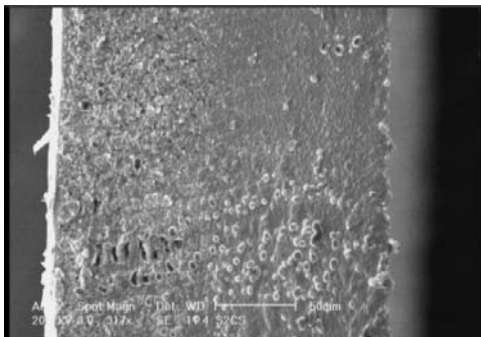
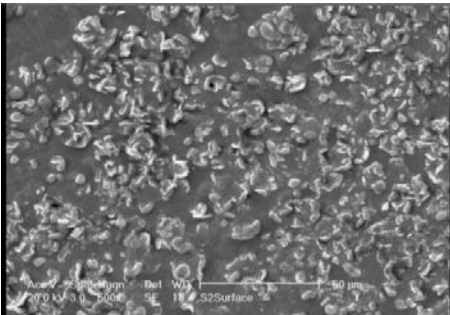
(SEM)

()

()



B



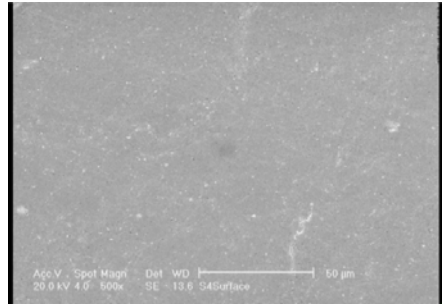
B

()

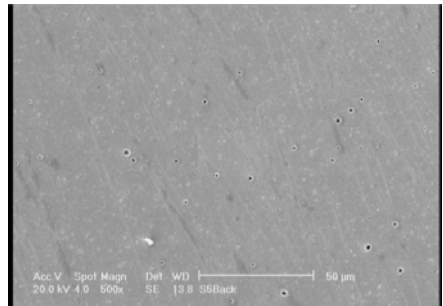
()

()

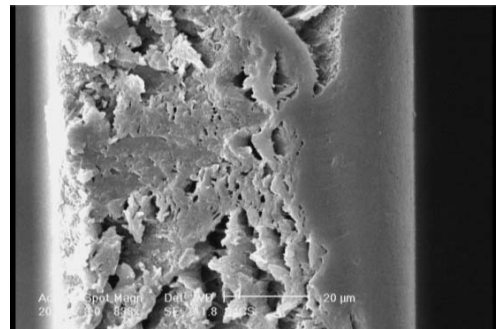
()



A



A



A

(B)

()

(E%)

(TS)

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