

MF-UF

+*

α -Al₂O₃

UFPHT20-6338

ZrO₂/TiO₂

pH

pH

m/s

ppm

MF-UF

KEY WORDS: Oil, MF-UF membrane, Permeation flux, Operating conditions, Emulassion, Model.

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$$J = kLn \frac{C_b}{C_c} \quad ()$$

[]

$$J = A_p \exp(-E_p / RT) \quad ()$$

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MF-UF

[]

[] ()

MF
MF

()

[]

() Effective handling of membrane fouling

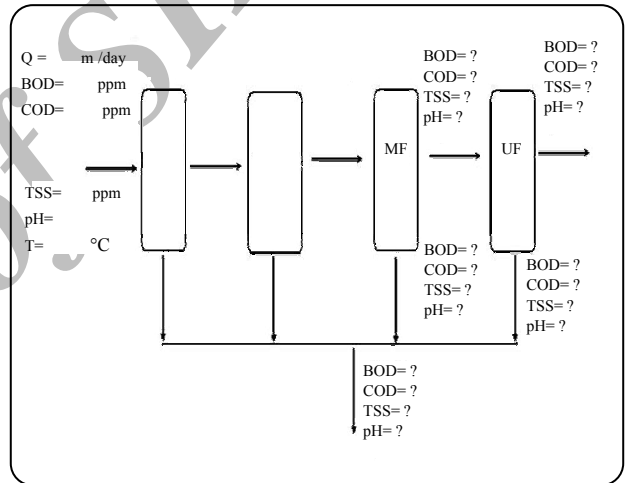
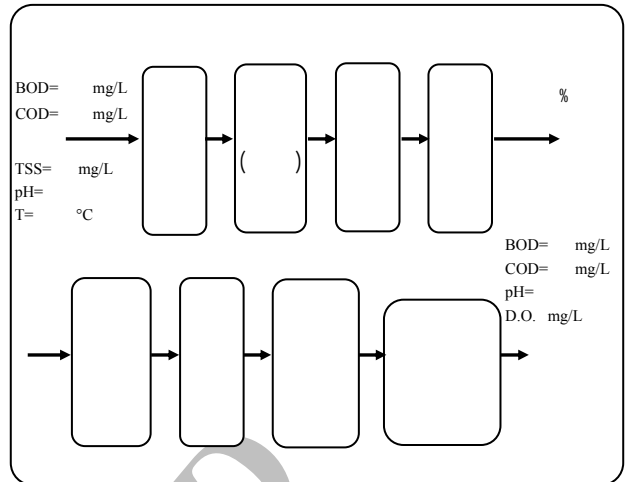
ZrO /TiO

Pall (TI.1070)

α -Al O

/

/



CPI

()

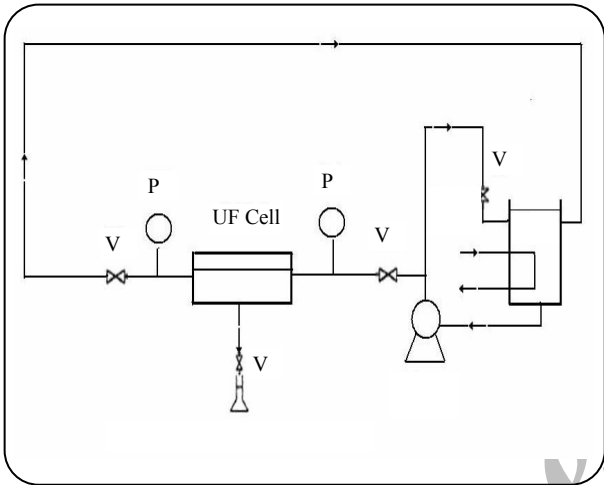
UF



MF

.MF

COD(ppm)	
BOD(ppm)	
TSS(ppm)	
Oil&Grease(ppm)	
TOC(ppm)	
pH	/



UF

UF

± 1

Pentax

mH O hp

bar

DOW UFPHT
UFPHT20-6338
MWCO=30 KD (PS)

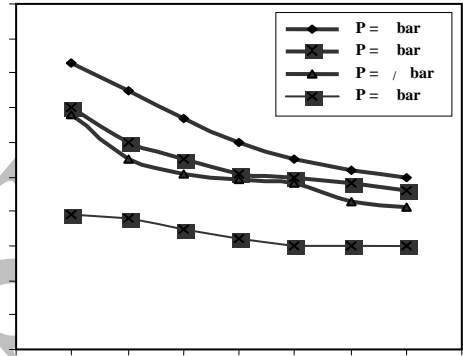
MF

[]

UF

COD(ppm)	
BOD(ppm)	
TSS(ppm)	
Oil&Grease(ppm)	
TOC(ppm)	
pH	/

[]



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ppm

pH

m/s

(SDS)

/ EDTA /

(/

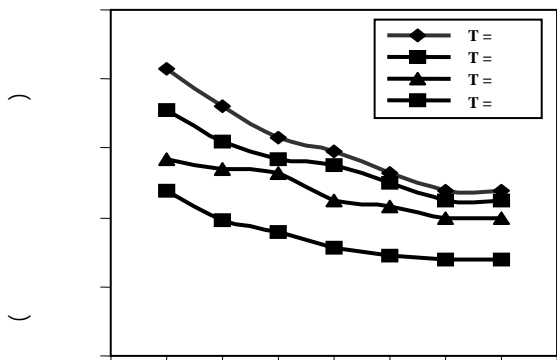
[]

/ /

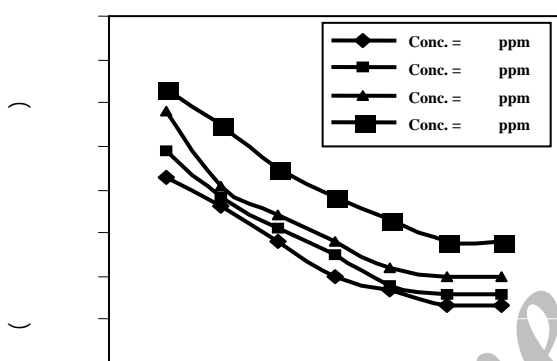
m/s bar

ppm

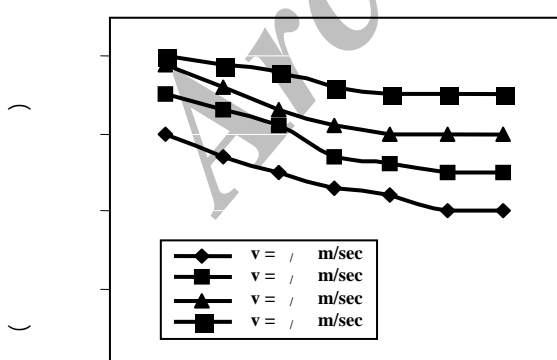
pH



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[]

()

/ / m/s

bar

pH

[]

ppm

pH

/ bar

pH

pH

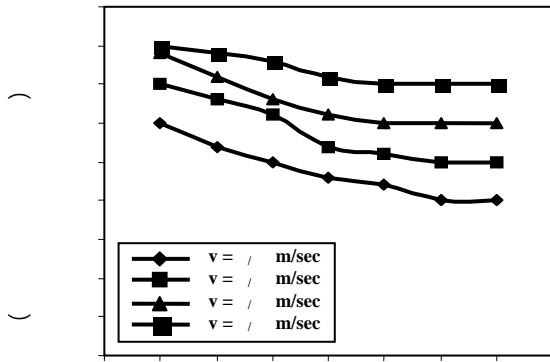
pH

pH

pH

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pH



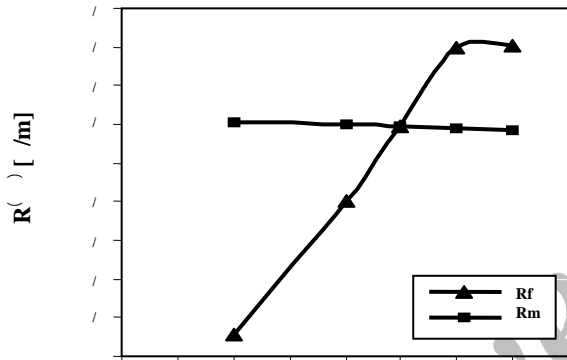
ppm

/ m/s bar

()

pH

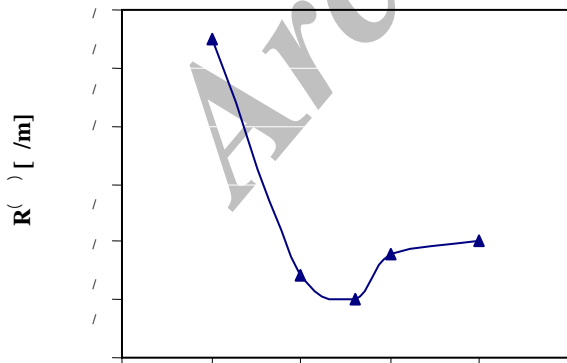
(R_m)



(R_f)

bar

()



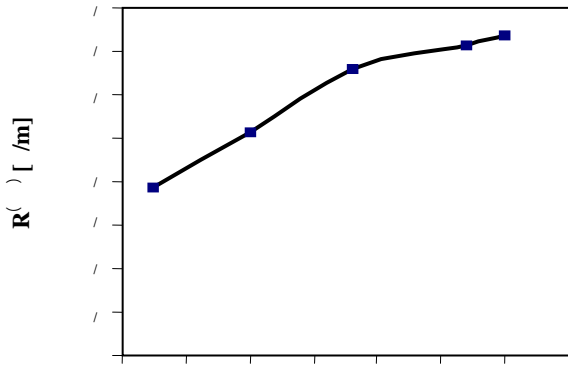
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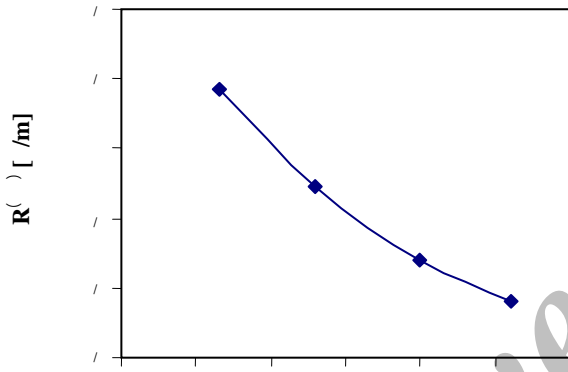
$$J = \frac{\Delta P - \sigma_k \pi}{\mu(R_m + R_f)} \quad ()$$

()

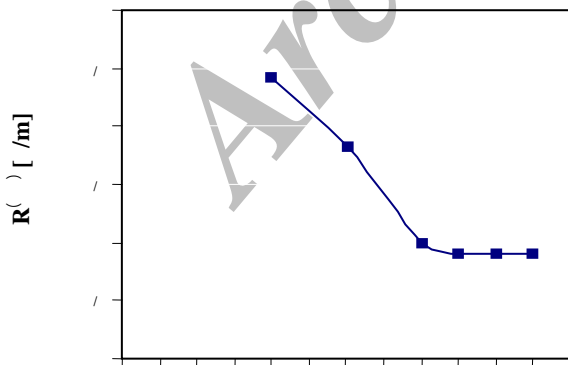
()



(ppm)



(m/s)



pH

pH

()

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pH
pH

pH pH

pH

pH

pH

Intermediate Blocking Filtration

Intermediate Blocking Filtration

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$$\frac{d^{\gamma}t}{dV^{\gamma}} = k \left[\frac{dt}{dV} \right]^n \quad ()$$

$$k = \frac{\sigma}{A_o} \quad n = \gamma \quad ()$$

Cake Filtration

Cake Filtration

Complete Blocking Filtration

Complete Blocking Filtration

$$R_t = R_o + \frac{\alpha \cdot \rho \cdot SV(t)}{(1-mS)A} \quad ()$$

$$k = R_o + \frac{\alpha \cdot \rho \cdot S}{(1-mS) \cdot A^{\gamma} \cdot R_o \cdot J_o} \quad n = \gamma \quad ()$$

$$\sigma = \gamma \cdot \Delta \frac{\rho_s \cdot S}{\rho_o \cdot d \cdot \phi} \quad k = J_o \cdot \sigma \quad n = \gamma \quad ()$$

ρ_s ρ_o S J_o

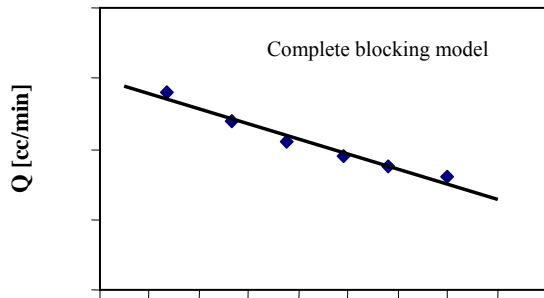
Standard Blocking Filtration

Standard Blocking Filtration

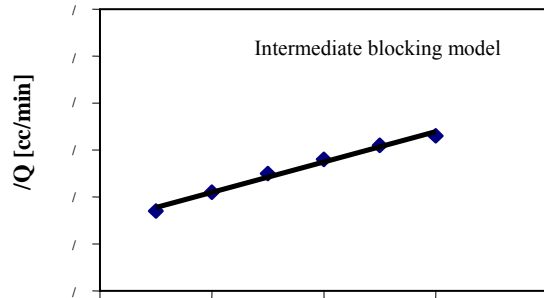
$$k = \gamma \frac{C}{L} \sqrt{\frac{J_o}{A_o}} \quad n = \frac{\gamma}{\gamma} \quad ()$$

A_o L C J_o

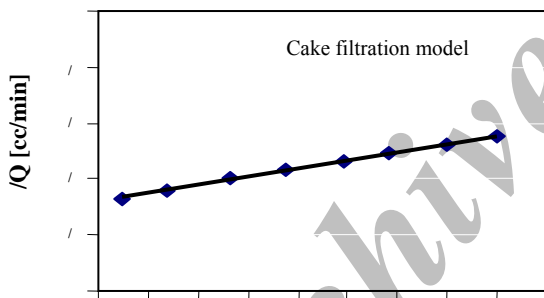
(Q)



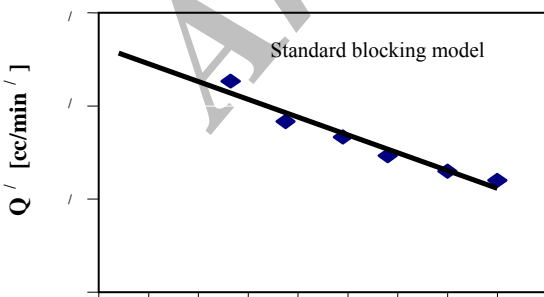
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$$(V) \quad (\bar{J}(t_p)) = (J_o - J^*) \cdot \frac{s}{a+s} \cdot \frac{1 - e^{-(s+a)t_p}}{1 - e^{-st_p}} + J^* Q_o$$

$k_i \quad k_c \quad k_s \quad k_b$ (t) []

Complete Blocking Filtration

$$Q = Q_o - k_b V \quad ()$$

Intermediate Blocking Filtration

$$\frac{1}{Q} = k_i + \frac{1}{Q_o} \quad ()$$

Standard Blocking Filtration

$$\sqrt{Q} = \sqrt{Q_o} - \left(k_s \sqrt{Q_o} \frac{V}{Q} \right) \quad ()$$

Cake Filtration

$$\frac{1}{Q} = \frac{1}{Q_o} + k_c V \quad ()$$

UF

Cake Filtration

Cake Filtration

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(J_{lim})

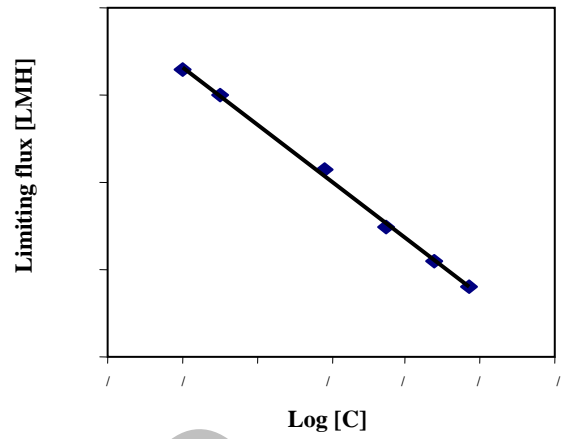
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$$J_{lim} = K \cdot \ln \left(\frac{C_g}{C_o} \right) \quad ()$$

C_g

K

MF kPa
 L/m .h UF
 MF UF
 / kWh/m



,UF-MF

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UF-MF

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