FILTERABILITY TESTS FOR THE CHARACTERIZATION OF THE WASTEWATER INFLUENT TO A MBR PROCESS.

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Presentation parts

- Introduction.
- Objectives.
- Materials and methods.
- Results.
- Conclusions

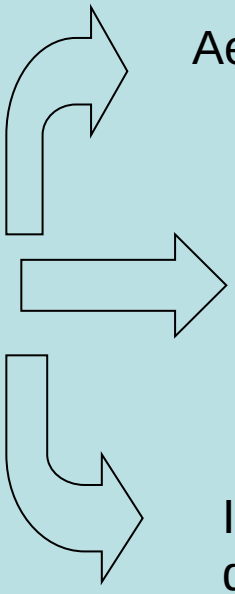
Introduction

- MBR is an activated sludge process with UF/MF instead of sedimentation for biomass separation.
- High effluent quality.
- Higher MLSS concentration, what implies lower reactor volume.

Introduction

Why is MBR not implemented in higher extent?

Operation costs

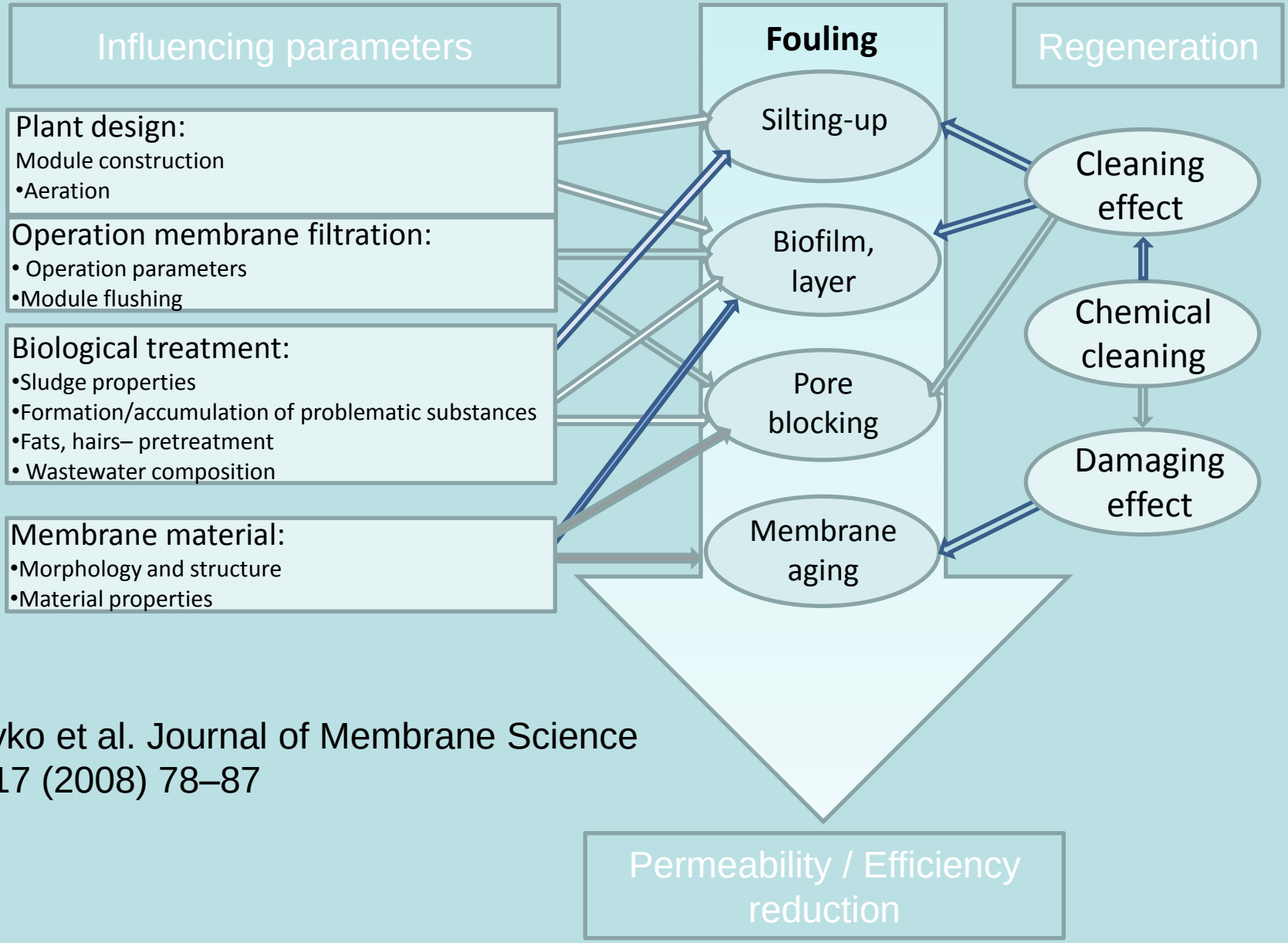


Aeration of the membranes to prevent **fouling**

Increase of the TMP by **fouling** phenomena

Increase of the fequency of membrane cleaning due to **fouling** phenomena

Introduction



Lyko et al. Journal of Membrane Science 317 (2008) 78–87

Objectives

The objective of this work is the evaluation of the characteristics of the wastewater, especially the filterability as a first approach to compare the treatability of different wastewaters by a MBR. Wastewater from 3 WWTPs in Castellón (Comunidad Valenciana) were compared.

Is a conventional watewater characterization appopriate for MBR processes?

BOD COD SS

Materials and methods

- **Sieving**

mesh sizes were 150, 500 and 900 µm

- **Wastewater characterization:** suspended solids, oil and greases.

- **Wastewater characterization:** hairs index???

Materials and methods

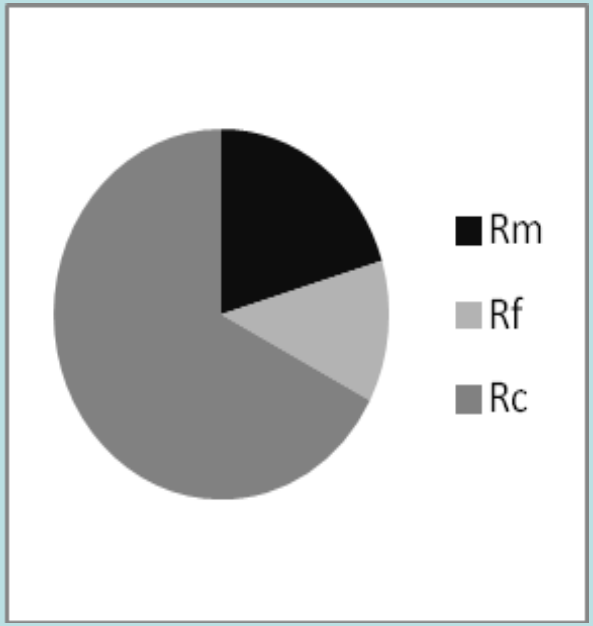
$$R_t = \frac{\Delta P}{\mu \cdot J_p}$$

$$R_t = R_m + R_c + R_f$$

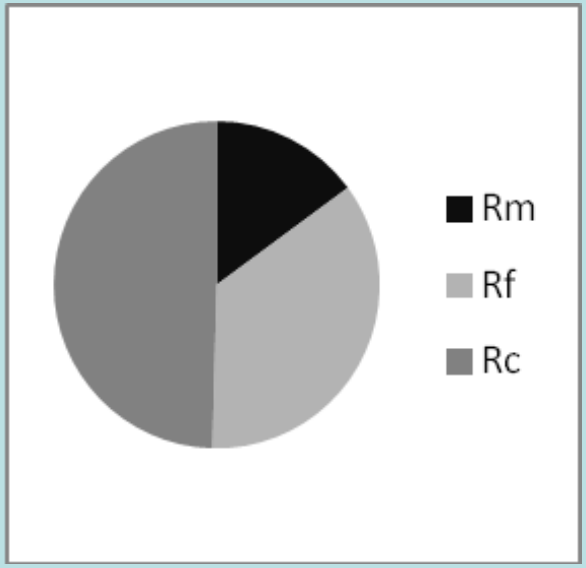
Results

	SS (PI)	SS after 900 µm filtration	SS after 500 µm filtration	SS after 150 µm filtration	SS (BPI)	Oils and greases (BPI)
WWTP 1 (3 mm sieve)	250.8 31.5	238.2 29.0	224.4 28.6	204.4 32.6	231.3 31.4	42
WWTP 2 (2 mm sieve)	253.6 25.4	239.8 22.7	233.4 25.0	211.1 9.5	231.5 14.2	32
WWTP 3 (3 mm sieve)	168.8 10.3	156.8 8.1	137.7 4.5	115.5 12.3	150.0 11.4	39

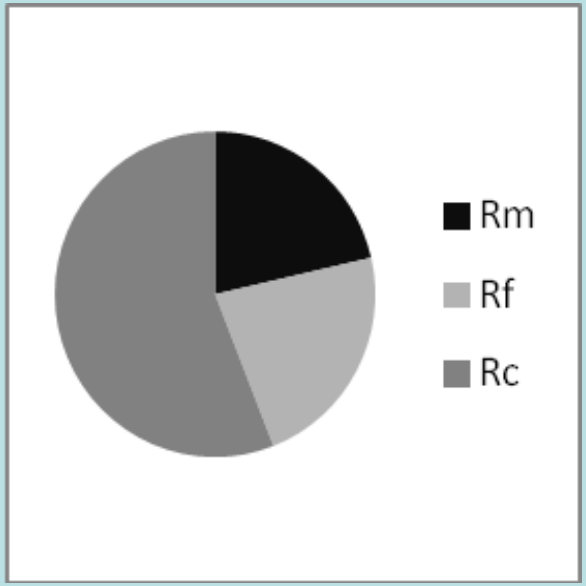
Results



sMWWTP 1

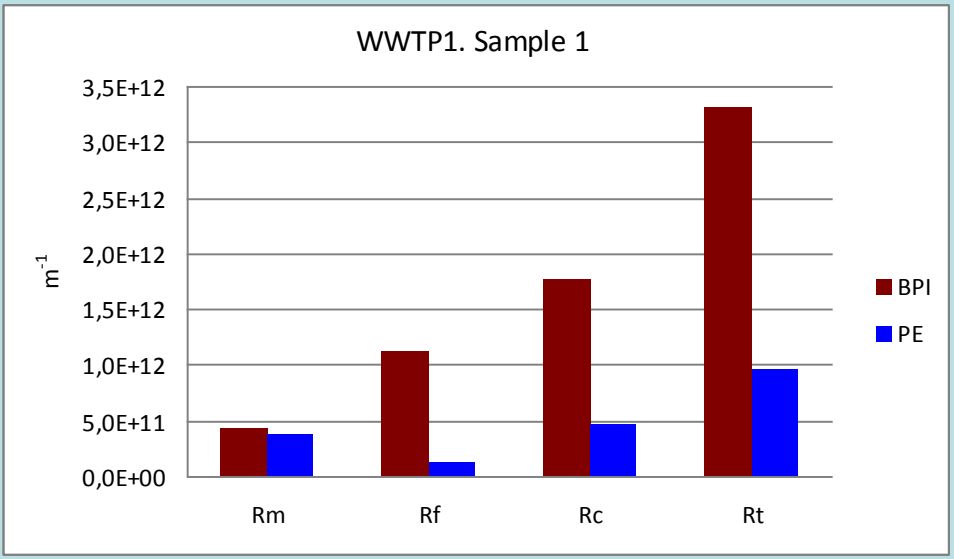


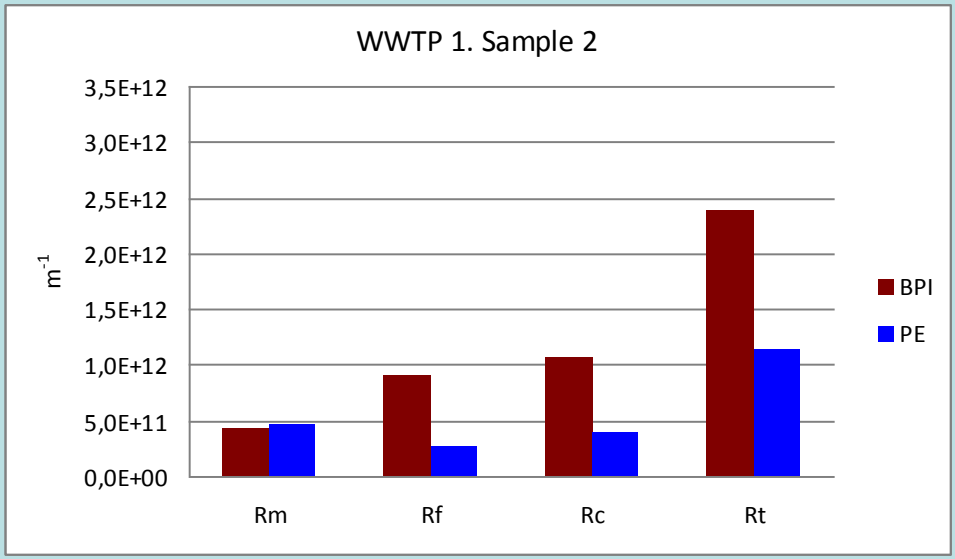
sMWWTP 2

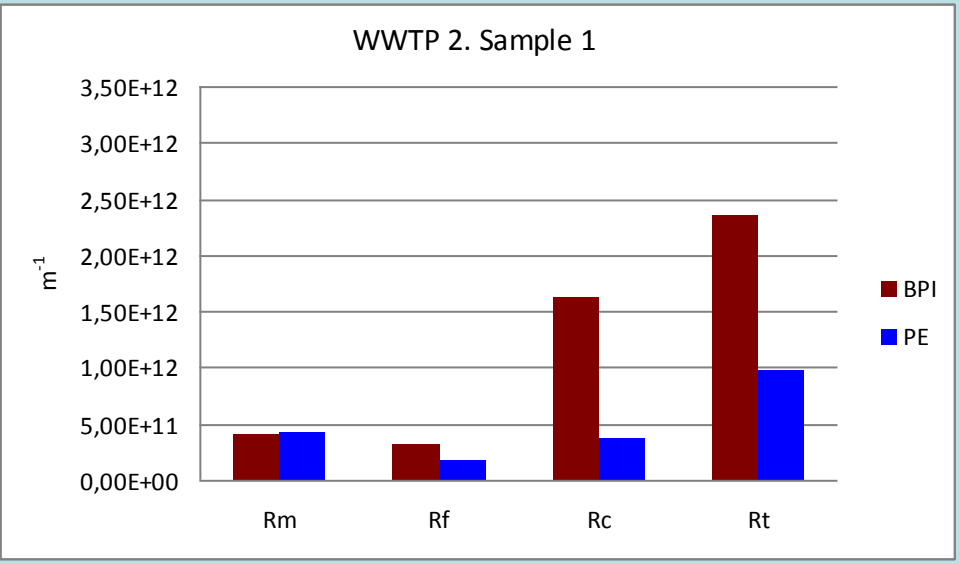


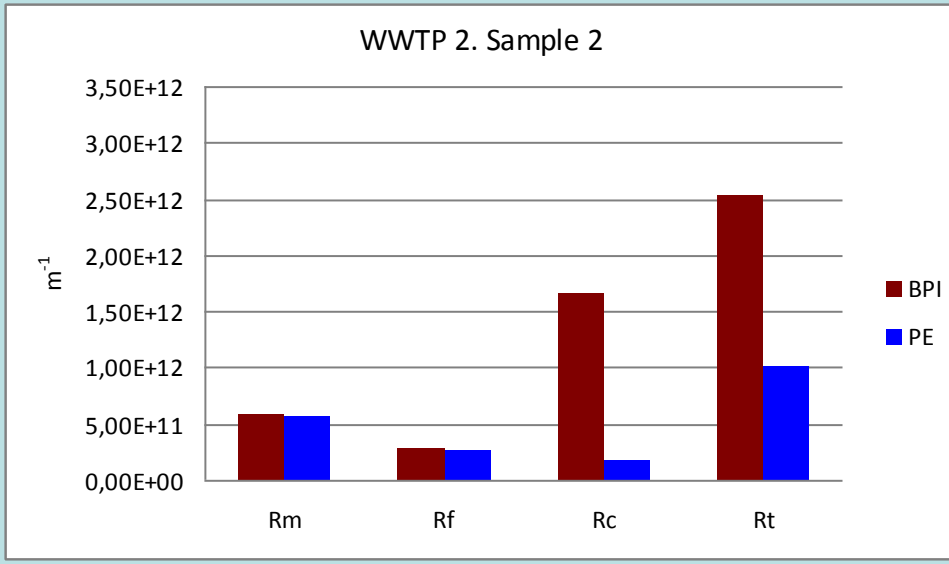
sMWWTP 3

Results

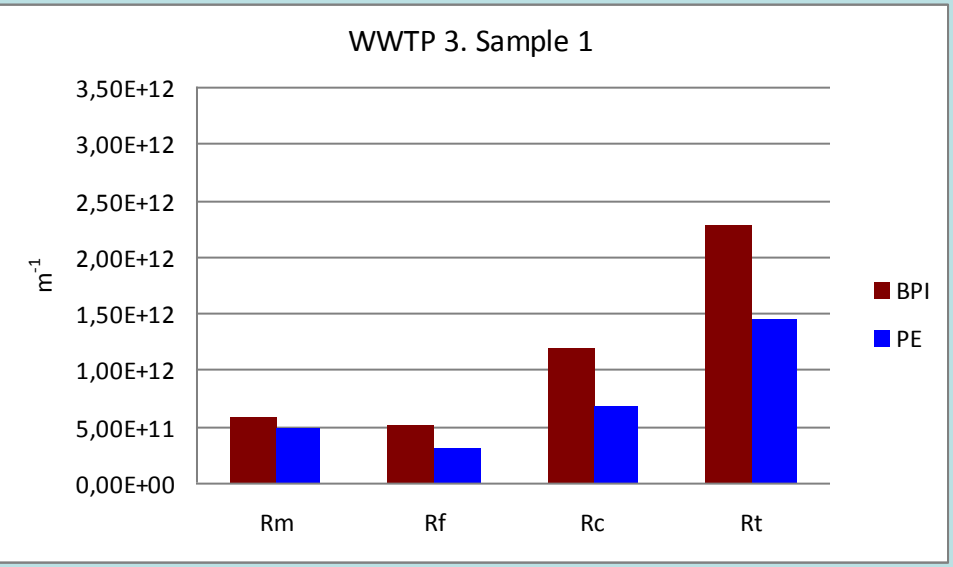

WWTP1. Sample 1
3,5E+12
3,0E+12
2,5E+12
2,0E+12
1,5E+12
1,0E+12
5,0E+11
0,0E+00
m-1
Rm
Rf
Rc
Rt
BPI
PE

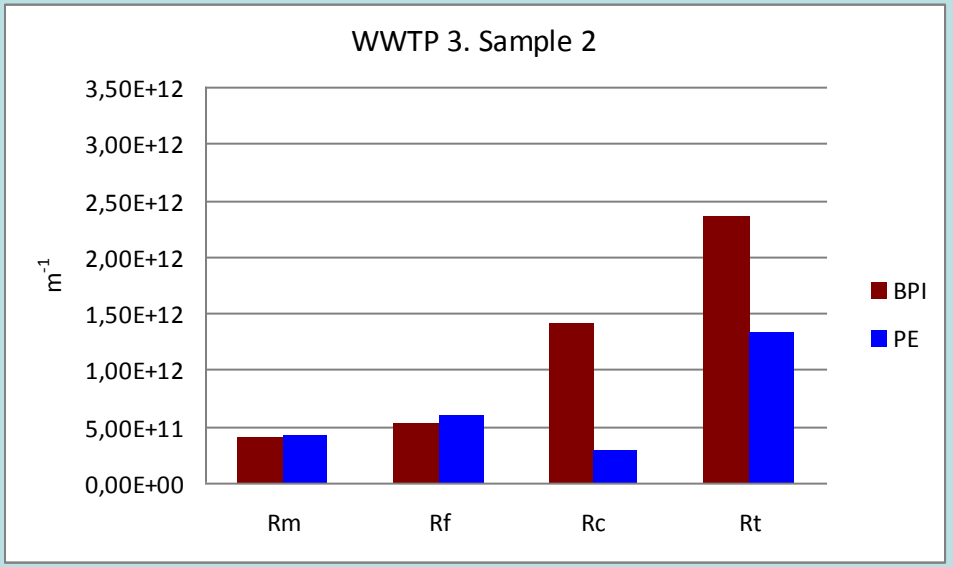

WWTP 1. Sample 2
3,5E+12
3,0E+12
2,5E+12
2,0E+12
1,5E+12
1,0E+12
5,0E+11
0,0E+00
m-1
Rm
Rf
Rc
Rt
BPI
PE


WWTP 2. Sample 1
3,50E+12
3,00E+12
2,50E+12
2,00E+12
1,50E+12
1,00E+12
5,00E+11
0,00E+00
m-1
Rm
Rf
Rc
Rt
BPI
PE


WWTP 2. Sample 2
3,50E+12
3,00E+12
2,50E+12
2,00E+12
1,50E+12
1,00E+12
5,00E+11
0,00E+00
m-1
Rm
Rf
Rc
Rt
BPI
PE

Results





STATISTICAL ANALYSIS

$$R_C = 8.7506 \cdot 10^9 + 3.1012 \cdot 10^7 \cdot SS$$

$$R_t = 1.69744 \cdot 10^{10} + 4.59939 \cdot 10^7 \cdot SS$$

Conclusions

- The parameter which had higher influence on the values of the membrane resistances was the SS concentration.
- R_f seems to be related with the oil and greases concentration. In view to an hypothetical MBR process, a wastewater with high R_f will cause higher fouling if these compounds are not degraded in the biological process.
- There is no statistical relationship between R_f in the wastewater and R_f of the treated effluent. The influence of the SMP can even imply a higher R_f value in the final effluent.
- It is necessary to find a “wastewater fouling index” as a function of fibre content, filterability and refractory COD.

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