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Title: A comparative study between a system of commercial mixed oxide ceramic membranes and a system of mixed oxide ceramic membranes impregnated with porcine gelatin for the removal of emergent pollutants.

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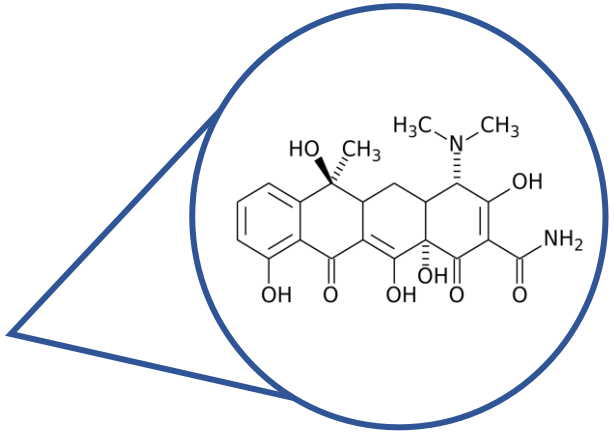
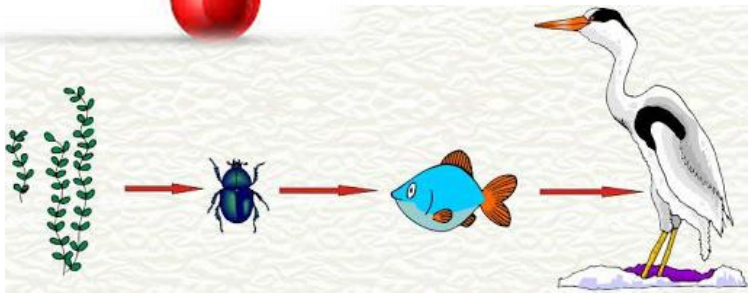
INTRODUCTION



Tetracycline with 29% use of the annual consumption.

Direct

Indirect



INTRODUCTION

Efficiencies greater than 80%

Less energy consumption

Higher chemical and thermal stability

METODOLOGY

Ceramic membranes impregnation

Deionized water was passed through the system for 20 min.

Gelatin solution (previously heated at 40 °C for 30 min) was passed through the system for 25 min.

The membrane was washed with the phosphate buffer solution pH 7

The inside of the membrane was filled with the prepared glutaraldehyde solution and placed vertically for 30 min at 20 °C

The membrane was washed with phosphate solution pH 7 and dried at 60 °C for 8 hours.

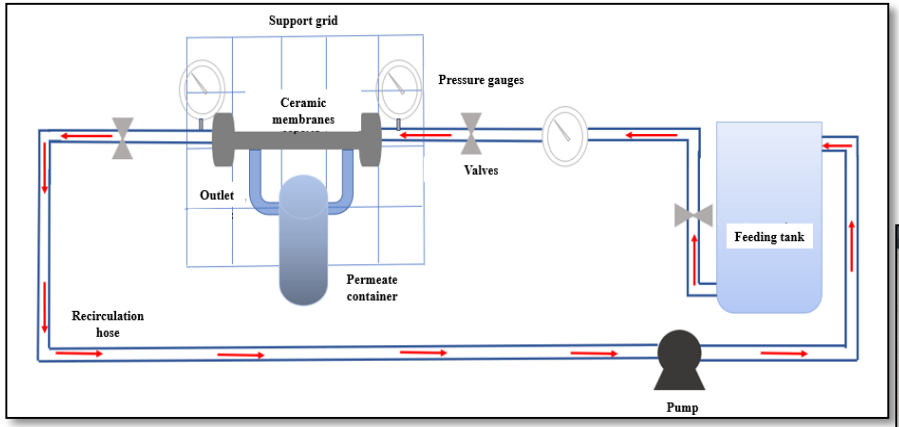
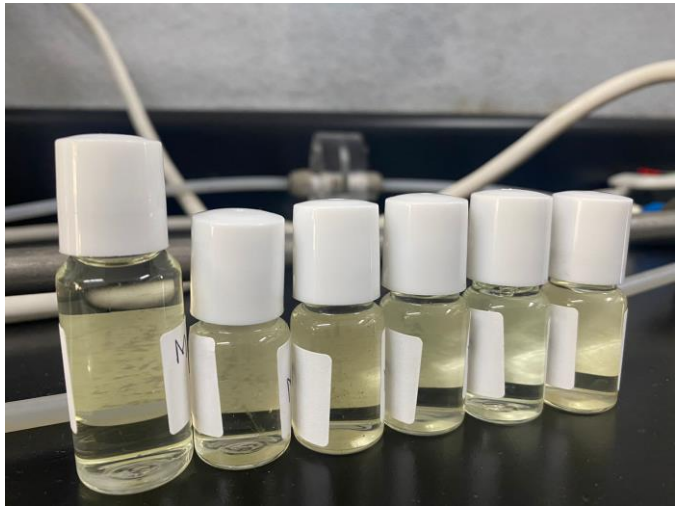


Fig. 1 Tangential Flow system

METODOLOGY

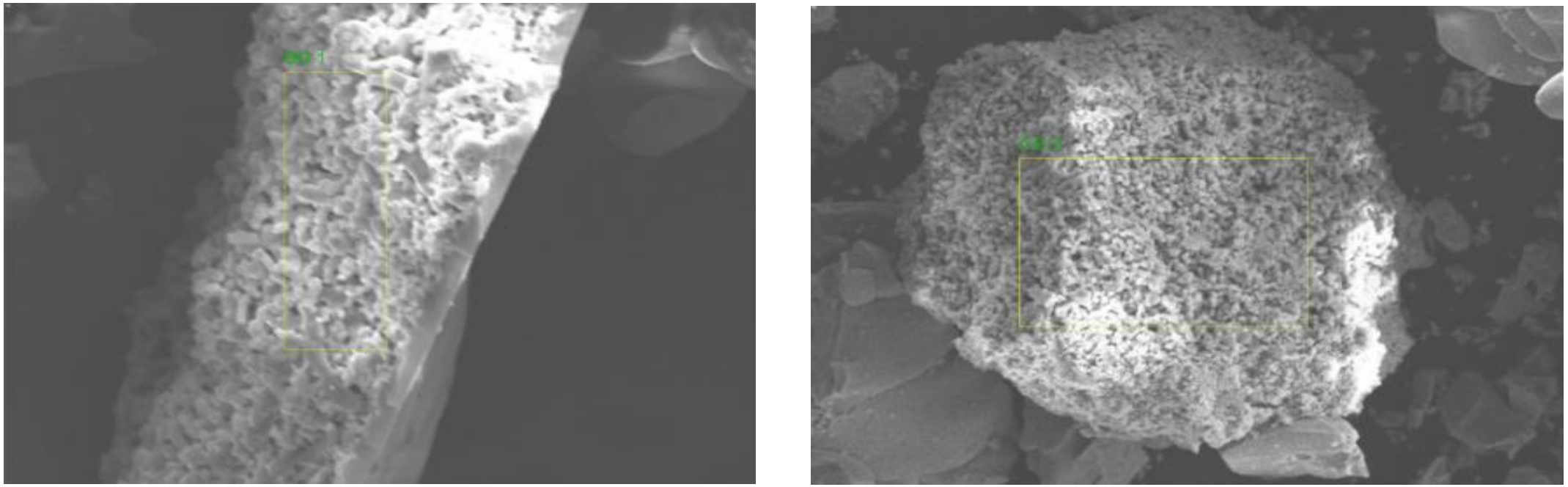
The change in surface morphology was analyzed by Scanning Electron Microscopy (SEM).

Remotion experiments were conducted with 80 mg/L TC pH 7.0 and room temperature for 60 minutes.
Samples were taken every 10 minutes and analyzed by ultraviolet- visible (UV-Vis) spectrophotometry at a maximum wavelength of 234 nm.



RESULTS

Characterization of the ceramic membrane impregnated with porcine gelatin



a) b)

Fig. 2 SEM images of ceramic membranes (a) before gelatin deposition and (b) after gelatin solution filtration (10 g L-1).

RESULTS

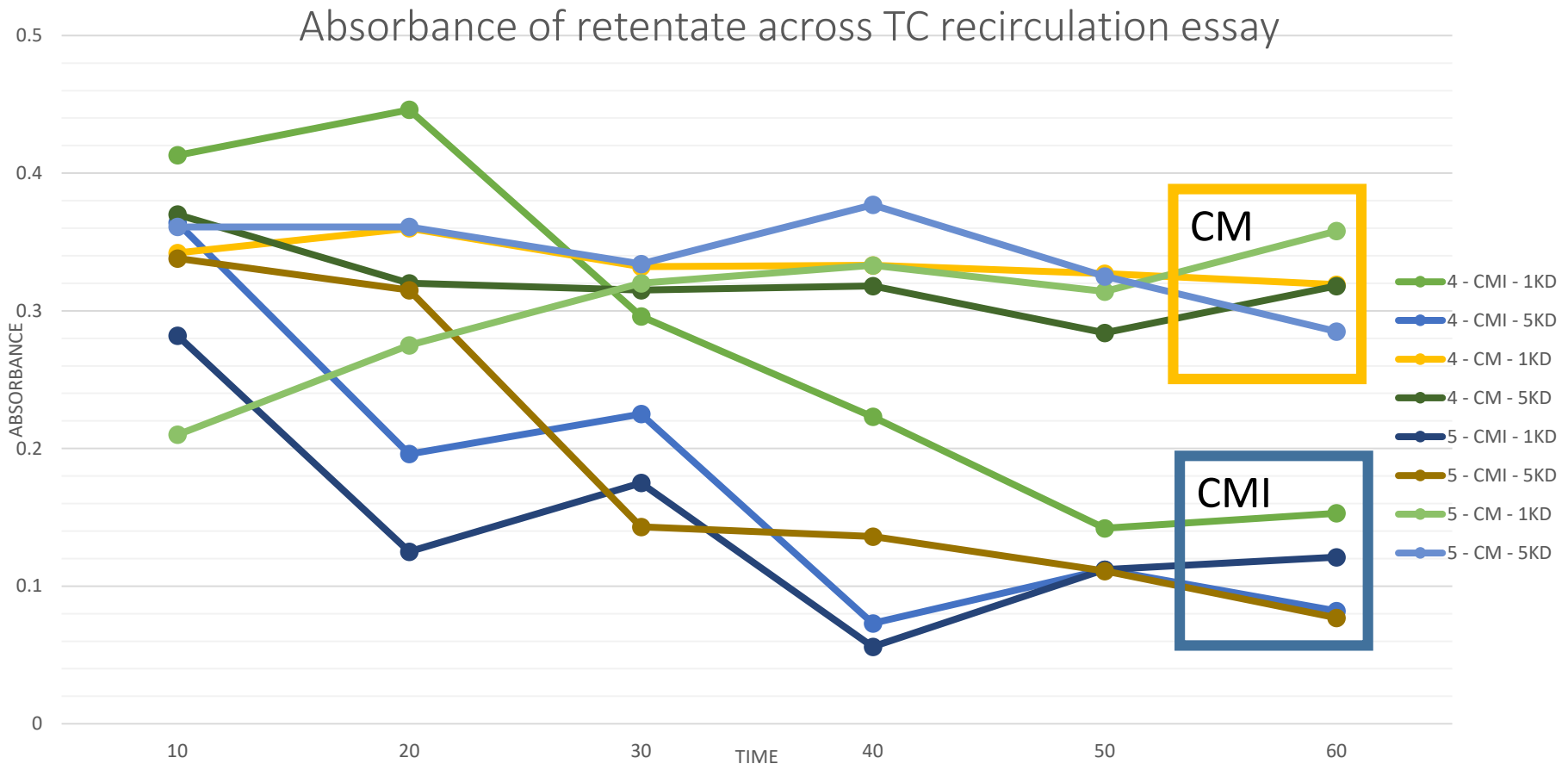


Fig. 3 Sample absorbance of tetracycline (au/min) over time of ceramic membranes impregnated with the porcine gelatin (CMI) compared with ceramic membranes (CM).

CONCLUSIONS

Ceramic membranes were successfully impregnated with the porcine gelatin via crossflow. The mechanism of action with the impregnation of porcine gelatin was adsorption and this was probed by the absorbance obtained on the impregnated membranes.

The impregnation of porcine gelatin tests has proved to be an efficient treatment for ceramic membranes. It also demonstrates that it improves the removal of TC in water. These impregnated membranes have promising potential for the removal of lower or higher molecular weight like Sulfadiazine, Ciprofloxacin, Erythromycin and others or separation of mixtures of low and high molecular weight antibiotics.

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