

## A vibration membrane bioreactor

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### ABSTRACT

Our previous works suggested that a vibration membrane prevented premature fouling of a membrane in a submerged membrane bioreactor application. A spring-mass system was designed and operated in conjunction with a shaker that allowed a vertically suspended hollow-fibre membrane bundle to vibrate vertically close to the spring's natural frequency. The set-up was used to investigate the fouling of a vibrating hollow-fibre membrane bundle submerged in water with clay suspension. Studies included the effects on membrane fouling due to different vibration parameters with and without aeration. Though cross flow velocity, aeration and vibration all contributed to the anti-fouling behavior of the membrane, vibration was found to be the most effective means. Tests indicated that vibration at low frequency and low amplitude was sufficient to keep the membrane almost free from fouling.

*Keywords:* Submerged membrane bioreactor; MBR; SBR; Hollow fibre; Ultrafiltration; Vibration membrane

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