

C717937 : MAJOR SANITARY ENGINEERING

KEY WORD: COLIPHAGE/ VIRUSES/ E.COLI/ ULTRAFILTRATION MEMBRANE/ HOLLOW FIBER MEMBRANE

NUTTAPONG LERTHPEETIPATH : COLIPHAGE REMOVAL EFFICIENCY OF MEMBRANE FILTRATION PROCESS FOR RAW WATER CONTAMINATED WITH COLIPHAGE AND E.COLI. THESIS ADVISOR : ASSO.PROF. PAIPHAN PHORNPRAPHA. 173 pp. ISBN 974-637-173-8.

The Objective of this experiment was to study the efficiency of coliphage removal from water by hollow-fiber ultrafiltration membrane. The effect of filtration rate and backwashing was investigated. The membrane pore size supplied in this study were 0.1 and 0.03 micron. The filtration rate were 0.5, 1.0, 1.5 and 2.0 litres per minute. respectively. There were 3 kinds of water samples : tap water with E.coli, tap water with coliphage and tapwater with E.coli and coliphage.

It was revealed that 0.1 and 0.03 micron membranes can remove all of E.coli in all filtration rate. Coliphage was detected in filtrated water from 0.1 micron membrane was 50 - 700 pfu/ml. and could not be detected in filtrate water from 0.03 micron membrane. The E.coli removal efficiency of both membranes was between 99.999998% - 99.9999999% (7.7 - 9 log). Whereas the coliphage removal efficiency of 0.1 micron membrane was between 99.998% - 99.9995% (4.8 - 5.3 log) and of 0.03 micron membrane was more than 99.99999% (7 log). For water sample with E.coli and coliphage, the E.coli removal efficiency of both membranes was 99.999998% - 99.9999998% (7.7 - 8.6 log). Whereas the coliphage removal efficiency of 0.1 micron membrane was 99.994 - 99.9997% (4.2 - 5.6 log) and of 0.03 micron membrane was 99.99999% - 99.999995% (6.9 - 7.3 log). The coliphage removal efficiency in any case of this research can exceed SWTR which require at least 4 log.

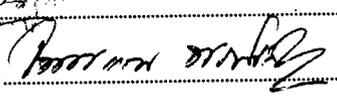
The resistance of membrane (Rm) in this study was $1.3 \times 10^{11} \text{ m}^{-1}$ for 0.1 micron membrane and $3.4 \times 10^{11} \text{ m}^{-1}$ for 0.03 micron membrane. The resistance index (RI) was between 0.54 - 0.92 that showed backwashing was not efficient in recovery of membrane.

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