LAUNDRY WASTE WATER TREATMENT WITH USING CROSS FLOW SILICA NANOFILTRATION MEMBRANE TO REDUCE TURBIDITY AND PHOSPHATE

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ABSTRACT

The increasing number of industrial laundry, causing pollution of water in affected downstream Surabaya River. Existing sewage treatment as coagulation and flocculation requires considerable land and a relatively long time. Thus requiring the processing of land and time saving technologies such as membrane.

In this study, laundry waste water treatment using nanofiltration membranes for rejected turbidity and phosphate. Silica obtained by the method of synthesis of alkali fusion is melting silica sand with KOH. Membrane preparation is made by using a solution of membranes and membrane painting. PVA, PEG and white cement added when printing membranes for membrane pore formation. Variations used in the manufacture of the membrane is the sum of the mass of silica is 5, 8, 10 grams. The use of cross flow reactor is considered capable of sweeping the permeate flow to prevent fouling too quickly. This study also used mainly diluted factor on waste 100%, 50%, 75%.

The aims of this study to get a mass effect on the coefficient of silica rejection and flux values at each variation of the membrane. Coefficient of rejection and flux values show the best variation of membrane morphology will be analyzed by the method of SEM (Scanning Electron Microscopy) and functional group analysis by the method of FTIR (Fourier Transform Infra Red). The best rejection coefficient obtained is 5 gram of 100% waste by rejection turbidity value 91.33% and phosphate rejection
56.07%. The best value obtained membrane flux 8 grams of 25% of waste water with value of $2.81 \text{ L/m}^2\text{.hour}$.

Keywords: Laundry waste, alkali fusion, silica, cross flow, nanofiltration, SEM, FTIR.