

BAB 5

KESIMPULAN DAN SARAN

Berdasarkan simulasi berbagai pengaruh berbagai variabel terhadap fluks permeat dalam proses desalinasi air laut dengan distilasi membran adalah sebagai berikut :

1. Semakin tinggi temperatur umpan fluks massa permeat akan semakin tinggi. Fluks permeat yang dihasilkan pada rentang temperatur umpan 50-70 °C adalah 9,688-42,112 kg/m².h.
2. Semakin tinggi temperatur permeat, fluks massa permeat akan semakin rendah. Fluks permeat yang dihasilkan pada rentang temperatur permeat 10-30 °C adalah 45,797-26,438 kg/m².h.
3. Semakin tinggi laju alir umpan, fluks massa permeat akan semakin tinggi. Fluks yang dihasilkan pada rentang laju alir umpan 0,2-0,6 m/s adalah 32,034-33,591 kg/m².h,
4. Semakin tinggi laju alir permeat, fluks massa permeat akan semakin tinggi. Fluks yang dihasilkan pada rentang laju alir permeat 0,2-0,6 m/s adalah 32,423-32,907 kg/m².h.
5. Semakin tebal membran yang digunakan, fluks massa permeat akan semakin rendah. Fluks yang dihasilkan pada rentang tebal membran 110-180 µm adalah 37,473-24,989 kg/m².h.
6. Semakin besar ukuran pori membran yang digunakan, fluks massa permeat akan semakin tinggi. Fluks yang dihasilkan pada rentang ukuran pori 0,2-0,55 µm adalah 25,474-44,129 kg/m².h.
7. Semakin besar porositas membran yang digunakan, fluks massa permeat akan semakin tinggi. Fluks yang dihasilkan pada rentang porositas 50-85% adalah 13,576-40,043 kg/m².h.
8. PTFE menghasilkan fluks massa permeat yang paling tinggi diantara membran lainnya karena memiliki konduktivitas termal paling tinggi.
9. Fluks permeat tertinggi dihasilkan pada temperatur umpan 65 °C, temperatur permeat 10 °C, laju alir umpan dan permeat 3 m/s, membran PVDF dengan ketebalan 130 µm, ukuran pori 0,3 µm dan porositas 75%.

10. Biaya investasi modul distilasi membran untuk menghasilkan 500kg/jam air diperkirakan sebesar \$18692,84.

Berdasarkan simulasi yang telah dilakukan, beberapa saran yang dapat diberikan untuk penelitian selanjutnya adalah sebagai berikut :

1. Perlu dilakukan optimasi untuk menentukan parameter-parameter yang tepat untuk menghasilkan fluks permeal yang tinggi dan hilang kalor yang rendah
2. Simulasi dengan model dinamik perlu dilakukan supaya dapat memberikan profil fluks pada alat distilasi membran dengan skala yang lebih besar.

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