

## ABSTRAK

Material hidrogel berbahan dasar polivinil alkohol, kitosan, dan bioflokulan TAD yang diikat-silang menggunakan *crosslinker* glutardialdehid telah disintesis. Pengaruh komposisi bahan dan suhu reaksi terhadap kinerja hidrogel telah dipelajari dengan cara memvariasikan volume polivinil alkohol dan bioflokulan TAD pada suhu reaksi 25°C dan 30°C. Uji kinerja yang dilakukan adalah pengukuran *swelling ratio*. Ukuran pori hidrogel dikarakterisasi dengan menggunakan *Scanning Electron Microscope* (SEM). Hasil percobaan menunjukkan bahwa *swelling ratio* meningkat sejalan dengan meningkatnya volume polivinil alkohol yang ditambahkan dan meningkatnya suhu reaksi. *Swelling ratio* pada suhu reaksi 25°C untuk hidrogel PVA1/TAD1 dengan komposisi polivinil alkohol sebanyak 5 mL, bioflokulan TAD sebanyak 5 mL dan kitosan sebanyak 5 mL sebesar 26,27%, untuk hidrogel PVA2/TAD1 dengan komposisi polivinil alkohol sebanyak 7,5 mL, bioflokulan TAD sebanyak 2,5 mL dan kitosan sebanyak 5 mL sebesar 27,23%, dan untuk hidrogel PVA dengan komposisi polivinil alkohol sebanyak 10 mL, bioflokulan TAD sebanyak 0 mL dan kitosan sebanyak 5 mL sebesar 40,28%. *Swelling ratio* pada suhu reaksi 30°C untuk hidrogel PVA1/TAD1 sebesar 29,76%, untuk hidrogel PVA2/TAD1 sebesar 32,34%, dan untuk hidrogel PVA sebesar 70,82%. Hasil analisis SEM menunjukkan ukuran pori – pori hidrogel PVA suhu reaksi 25°C berkisar antara 0,05 – 1,25 µm, hidrogel PVA suhu reaksi 30°C berkisar antara 0,05 – 0,65 µm dan hidrogel PVA2/TAD1 suhu reaksi 30°C berkisar antara 0,02 – 0,4 µm.

**Kata Kunci** : Hidrogel, *Swelling Ratio*, Polivinil Alkohol, Bioflokulan TAD, Kitosan

## ABSTRACT

Hydrogel Materials made from polyvinyl alcohol, chitosan, and bioflokulan TAD crosslinked using glutardialdehid as crosslinker was synthesized. Effect of composition and reaction temperature on the performance of hydrogels has been studied by varying the volume of polyvinyl alcohol and bioflokulan TAD at reaction temperature 25 ° C and 30 ° C. Performance test conducted was swelling ratio measurements. Pore size of hydrogels were characterized using Scanning Electron Microscope (SEM). The results showed that the swelling ratio increases with increasing volume of polyvinyl alcohol and the reaction temperature increases. Swelling ratio at a reaction temperature of 25°C for PVA1/TAD1 hydrogel with composition 5 mL of polyvinyl alcohol, 5 mL of bioflokulan TAD and 5 mL of chitosan as much as 26.27%, for PVA2/TAD1 hydrogel with polyvinyl alcohol composition by 7.5 mL, 2.5 mL of bioflokulan TAD and 5 mL of chitosan as much as 27.23%, and for PVA hydrogel with composition 10 mL of polyvinyl alcohol, 0 mL of bioflokulan TAD and 5 mL of chitosan as much as 40.28%. Swelling ratio at a reaction temperature of 30°C for the hydrogels PVA1/TAD1 of 29.76%, for the hydrogel PVA2/TAD1 by 32.34% and 70.82% of PVA hydrogel. The results of SEM analysis showed the size of pores of PVA hydrogel at reaction temperature of 25°C ranged from 0.05 to 1.25 $\mu$ m, PVA hydrogel at reaction temperature 30°C ranged from 0.05 to 0.65 $\mu$ m and PVA2/TAD1 hydrogel at reaction temperature of 30°C ranged from 0.02 to 0.4 $\mu$ m.

**Keyword:** Hydrogel, Swelling Ratio, Polivinil Alkohol, Bioflokulan TAD, chitosan