



## BAB V

### KESIMPULAN DAN SARAN

#### 5.1 Kesimpulan

Pada hasil penelitian kajian penggunaan biji asam jawa (*Tamarindus indica*) sebagai koagulan dalam pengolahan limbah cair tekstil, dapat ditarik kesimpulan sebagai berikut:

1. Hasil analisa *FTIR* menunjukkan bahwa biji asam jawa yang digunakan mengandung gugus hidroksil, *amine*, alkana, karboksil, dan aromatis dimana sebagian gugus tersebut terdapat pada senyawa protein dan polisakarida yang menjadi bahan aktif dari koagulan alami biji asam jawa.
2. Ukuran koagulan biji asam jawa yang memberikan *%-removal* tertinggi adalah -70 +100 mesh dengan perolehan *%-removal* sebesar 77,67%.
3. Nilai variabel pH mempengaruhi perolehan *%-removal* zat warna karena adanya pengaruh titik isoelektrik dari protein. Perolehan *%-removal* terbaik di kondisi pH = 3 untuk semua dosis koagulan, 1 g/L, 2 g/L, dan 3 g/L secara berturut-turut, dengan perolehan *%-removal* sebesar 79,42 %, 81,60 % dan 84,60%.
4. Dosis koagulan mempengaruhi perolehan *%-removal* zat warna. Perolehan *%-removal* terbaik secara umum berada di kondisi dosis tertinggi (3 g/L) untuk variasi pH 2, 3, 4, 5, 6, dan 7 secara berturut-turut, yaitu 62,19 %, 84,60 %, 81,30 %, 37,37 %, 15,35 % dan 12,60 %.
5. Berdasarkan uji anova nilai pH, dosis, dan interaksinya berpengaruh secara signifikan terhadap penurunan konsentrasi zat warna di dalam limbah cair tekstil sintetik.
6. Mekanisme koagulasi-flokulasi pada limbah cair tekstil sintetik pada parameter warna adalah berupa *charge neutralization* dan *particle bridging* yang disebabkan oleh kandungan protein dan polisakarida pada biji asam jawa.
7. Kegagalan penurunan turbiditas diakibatkan oleh adanya hambatan viskositas dari Na-CMC yang menyulitkan bahan aktif biji asam jawa larut untuk melakukan mekanisme koagulasi.

#### 5.2 Saran

Berdasarkan penelitian yang telah dilakukan, berikut saran yang dapat dilakukan untuk penelitian selanjutnya:

1. Proses perendaman biji asam jawa di dalam air bisa diperpanjang agar lebih memudahkan proses pemisahan antara daging buah dengan biji buah asam jawa.
2. Variasi ukuran partikel dan dosis biji asam jawa masih dapat diperluas agar dapat mengetahui kondisi optimum dari ukuran biji dan dosis yang paling baik digunakan dalam proses koagulasi-flokulasi.
3. Variasi konsentrasi air limbah zat warna dapat dilakukan untuk mengetahui seberapa jauh batas kemampuan koagulan alami biji asam jawa dalam proses koagulasi-flokulasi.
4. Untuk uji penurunan turbiditas, masih perlu dilakukan variasi rasio antara kandungan Na-CMC dan bahan padatan dalam air limbah cair sintetik dengan dosis koagulan untuk memaksimalkan fungsi dari bahan aktif koagulan biji asam jawa dalam mekanisme koagulasi.
5. Dapat dilakukan penambahan asam untuk mengatasi hambatan viskositas yang menyulitkan kerja koagulan biji asam jawa



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