

BAB V

KESIMPULAN DAN SARAN

5.1 Kesimpulan

Penelitian ini berfokus pada koagulasi zat biner dengan menggunakan koagulan alami dari ekstrak kasar protein biji *Moringa oleifera*. Koagulasi terjadi karena adanya netralisasi muatan negatif antara zat warna dengan muatan positif dari protein. Penentuan pH, dosis koagulan dan konsentrasi awal zat warna dilakukan untuk mengetahui kondisi terbaik proses koagulasi. Kesimpulan yang diperoleh adalah:

1. Koagulasi zat warna biner menggunakan koagulan alami berupa ekstrak kasar biji *Moringa oleifera* terjadi akibat netralisasi muatan; pada pH 3 dengan persentase *removal congo* merah dan *tartrazine* sebesar 93,87 dan 77,64 %.
2. Dosis koagulan terbaik koagulasi zat warna biner pada pH 3 sebesar 1000 mg eq BSA/L; diikuti penurunan persen *removal* zat warna pada dosis koagulan yang lebih tinggi akibat terjadinya restabilisasi koloid sehingga *sludge* menjadi lebih berpori.
3. Konsentrasi awal zat warna biner yang semakin bertambah menimbulkan munculnya efek sinergistik pada *tartrazine* seiring dengan penurunan persen *removal* zat warna 76 ke 72% akibat adanya interaksi elektrostatik antara gugus amina terprotonasi dari *congo* merah dengan gugus sulfonat bermuatan negatif dari *tartrazine* pada pH 3 pada permukaan protein; sementara itu pada *congo* merah mengalami efek *non interactive* dengan persen *removal* konstan pada rentang 93 – 95% karena pengaruh kehadiran *tartrazine*.
4. Peningkatan profil volume *sludge* pada kondisi biner dengan konsentrasi 200 mg/L zat warna biner (57 mL/L) pada dosis koagulan 1000 mg eq BSA/L lebih tinggi dari hasil koagulasi zat warna *tartrazine* (27 mL/L) akibat efek sinergistik dari *tartrazine*, sementara volume *sludge* zat warna *congo* merah (190 mL/L) lebih tinggi dari pada kondisi binernya akibat *non interaktif* yang terjadi.

5.2 Saran

Berdasarkan kesimpulan di atas, jika meninjau volume *sludge* yang dihasilkan dan profil pengaruh dosis koagulan terhadap %-*removal* maka untuk penelitian selanjutnya disarankan:

1. Untuk meminimisasi volume *sludge* pada koagulasi zat warna biner perlu dilakukan pengembangan/modifikasi koagulan yang digunakan, salah satunya menggunakan fungsional magnetit protein *Moringa oleifera* yang sekaligus juga dapat meningkatkan persen *removal*.
2. Rentang dosis koagulan perlu diperluas sehingga profil penurunan persen *removal* dapat lebih teramati pada rentang yang lebih luas.

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