BAB V
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Berdasarkan penelitian yang telah dilakukan, dapat disimpulkan beberapa hal sebagai berikut:

1. Kinerja koagulasi limbah sintetik zat warna kongo merah sangat dipengaruhi oleh pH awal limbah. %-*removal* akan terus meningkat dari pH 3-6, menurun pada pH 7, dan meningkat lagi pada pH 8. Sedangkan, volume *sludge* akan menurun pada pH 3-7, dan meningkat pada pH 8. Hal ini disebabkan karena pada pH tersebut, kongo merah bermuatan negatif sedangkan alum bermuatan positif dalam bentuk spesi Al^{3+}.

2. Peningkatan dosis pektin sebagai koagulan pembantu pada koagulasi limbah sintetik zat warna kongo merah akan meningkatkan %-*removal* zat warna kongo merah serta *volume sludge* yang dihasilkan. Peningkatan %-*removal* terjadi hingga titik kritik dimana penambahan dosis koagulan tidak akan meningkatkan aktivitas koagulasi lebih lanjut, sedangkan volume *sludge* terus meningkat hingga dosis tertinggi yaitu 100 mg/L.

3. Peningkatan konsentrasi awal zat warna kongo merah pada koagulasi limbah sintetik zat warna kongo merah akan menurunkan %-*removal* dan volume *sludge* yang dihasilkan. Semakin tinggi konsentrasi awal zat warna, maka jumlah partikel akan semakin banyak dan meningkatkan kebutuhan koagulan. Sehingga pada dosis koagulan tetap dan konsentrasi zat warna yang terus ditingkatkan, %-*removal* yang dihasilkan semakin menurun. Karena persentase zat warna terkoagulasi yang semakin sedikit, maka jumlah volume *sludge* yang dihasilkan pula akan mengalami penurunan. Pada penelitian ini, diperoleh konsentrasi awal kongo merah terbaik pada 50 mg/L dengan %-*removal* mencapai 97,14% dan volume *sludge* sebesar 14 mL/L.

4. Parameter model Langmuir dan Freundlich tidak dapat digunakan untuk mendeskripsikan proses adsorpsi karena terdapat beberapa parameter yang tidak sesuai antara model. Baik variasi alum dan alum + pektin dapat digambarkan dengan model BET karena model ini lebih kompleks sehingga ada kecocokan antara model dengan parameter.

5.2 Saran

Berdasarkan penelitian yang dilakukan, disarankan agar:

1. Perlu dilakukannya analisis zeta potensial larutan pada penggunaan koagulan alum saja, pektin saja, maupun alum + pektin untuk analisis performa koagulasi lebih lanjut terutama volume *sludge*.
2. Perlu dilakukannya analisis nilai COD pada limbah sintetik zat warna kongo merah.

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