BAB V
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Berdasarkan hasil penelitian yang telah dilakukan, dapat disimpulkan bahwa:

1. Proses adsorpsi menggunakan adsorben Fe_3O_4–AG dan Fe_3O_4–AH memiliki kinerja yang lebih baik dibandingkan Fe_3O_4 karena adanya gugus hidroksil (–OH) tambahan yang menyebabkan BSA dapat berikatan lebih banyak pada permukaan adsorben.
2. Kapasitas adsorpsi Fe_3O_4, Fe_3O_4–AG, dan Fe_3O_4–AH dipengaruhi oleh pH. Kapasitas maksimum adsorpsi terjadi pada pH 4,8; mendekati titik isoelektrik BSA karena pada pH ini, konfigurasi BSA di dalam larutan akan berbentuk globular menghasilkan struktur yang lebih kompak dan memudahkan terjadi adsorpsinya. Interaksi utama yang terjadi antara adsorben Fe_3O_4–AG dan Fe_3O_4–AH dengan BSA adalah interaksi hidrofobik.
3. Adsorben Fe_3O_4, Fe_3O_4–AG, dan Fe_3O_4–AH mengalami peningkatan kapasitas adsorpsi secara signifikan seiring dengan kenaikan konsentrasi awal BSA dan temperatur adsorpsi.
4. Model isoterm Freundlich merupakan model adsorpsi paling tepat untuk menggambarkan proses adsorpsi Fe_3O_4, Fe_3O_4–AG, dan Fe_3O_4–AH yang membentuk permukaan *multilayer*.
5. Adsorpsi BSA oleh Fe_3O_4, Fe_3O_4–AG , ataupun Fe_3O_4–AH terjadi secara spontan, endotermis, dan adanya keacakan molekul BSA pada permukaan adsorben yang ditunjukkan nilai energi Gibbs ($\Delta G°$) yang negatif, entalpi ($\Delta H°$) yang positif, dan entropi ($\Delta S°$) yang positif secara berturut-turut.

5.2 Saran

Beberapa saran yang dapat diberikan untuk penelitian lebih lanjut, adalah:

1. Perlu dilakukan analisis titik pH *zero charge* Fe_3O_4, Fe_3O_4–AG, dan Fe_3O_4–AH untuk memperoleh jumlah muatan yang lebih akurat.
2. Perlu dilakukan analisis *X-ray Photoelectron Spectroscopy* (XPS) untuk mengidentifikasi gugus fungsi yang terbentuk secara kuantitatif.

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