INTISARI

BALON SHIRASU DAN BALON SHIRASU TERMODIFIKASI POLIDOPAMIN (PDA) UNTUK ADSORPSI BIRU METILEN

Oleh

Chairunnisa
13/350619/PPA/04106

Pengembangan balon shirasu (BS) termodifikasi polidopamin (PDA) telah dilakukan. Pengembangan tersebut bertujuan untuk meningkatkan kinerja balon shirasu dalam mengadsorpsi biru metilen. Pembuatan BS termodifikasi PDA (BS/PDA) dilakukan dengan merendam BS dalam larutan dopamine pada keadaan basa aerobik. Material yang telah terbentuk dikarakterisasi menggunakan FTIR, SEM-EDS, luas permukaan spesifik adsorpsi-desorpsi N_2, dan *zeta potential*. Perilaku adsorpsi BS sebelum dan sesudah modifikasi dianalisis melalui studi pengaruh pH, kinetika adsorpsi, isoterm adsorpsi dan pengaruh konsentrasi garam.

Kinetika adsorpsi BS sebelum dan sesudah modifikasi dianalisis menggunakan model kinetika orde satu semu dan orde dua semu. Isoterm adsorpsi dianalisis menggunakan model isoterm adsorpsi Langmuir dan Freundlich. Hasil studi adsorpsi menunjukkan bahwa isoterm adsorpsi mengikuti model Langmuir dengan kapasitas adsorpsi maksimum pada suhu 25 °C sebesar 26,17 mg g^{-1} untuk BS dan sebesar 36,23 mg g^{-1} untuk BS/PDA. Kinetika adsorpsi kedua material mengikuti model kinetic orde dua semu

Kata kunci: balon shirasu, polidopamin, adsorpsion, biru metilen

ABSTRACT

SHIRASU BALLOONS AND SHIRASU BALLOONS MODIFIED WITH POLYDOPAMINE (PDA) FOR ADSORPTION OF METHYLENE BLUE

By

Chairunnisa
13/350619/PPA/04106

The development of shirasu balloons (SB) modified with polydopamine (PDA) has been conducted. The aim of this research is to increase the performance of shirasu balloons in the adsorption application towards methylene blue (MB). The SB modified with PDA (SB/PDA) was prepared by immersed SB in the dopamine solution in the aerobic alkaline condition. The prepared material was characterized using FTIR, SEM-EDS, specific surface area N_2 sorption, and zeta potential. The adsorption behavior of SB and SB/PDA was investigated by study of effect of pH, adsorption kinetics, and effect of salt concentration.

The adsorption kinetics of SB before and after modification was analyzed using two kinetics models i.e. pseudo-first-order and pseudo-kinetics-order. The adsorption isotherm model was analyzed using Langmuir and Freundlich isotherm model.The adsorption study result showed that the adsorption isotherm was fitted to Langmuir isotherm model at 25 °C with maximum capacity could reach up to 26.17 mg g^{-1} for SB only and 36.23 mg g^{-1} for SB/PDA. Adsorption kinetics showed that adsorption behavior followed the pseudo-second-order kinetic model.

Keywords: shirasu balloons, polydopamine, adsorption, methylene blue.