

**BEADS BERBASIS KITOSAN TERMODIFIKASI OLEH EPTAC
(*Epoxypropyltrimethylammonium Chloride*) SEBAGAI ADSORBEN ZAT
WARNA REMAZOL YELLOW FG**

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INTISARI

Penelitian mengenai aktivitas adsorben beads-kitosan termodifikasi EPTAC dalam melakukan proses adsorpsi zat warna Remazol Yellow FG (RYFG) telah dilakukan. Penelitian ini bertujuan untuk melakukan modifikasi terhadap kitosan dengan senyawa EPTAC dan pembentukan sebagai adsorben beads yang selanjutnya dilakukan karakterisasi, optimasi kondisi, dan kajian terhadap model kinetika dan isotherm adsorpsi. Modifikasi dilakukan dengan melakukan reaksi antara kitosan dengan senyawa EPTAC dalam keadaan basa akibat penambahan larutan Natrium Hidroksida (NaOH) selama 24 jam. Pembentukan adsorben beads dilakukan dengan melarutkan kitosan ke dalam larutan Asam Asetat 1% (CH_3COOH) dilanjut dengan penambahan glutaraldehid dan campuran diteteskan ke dalam larutan NaOH menggunakan *syringe*. Adsorben beads-kitosan termodifikasi dikarakterisasi menggunakan ATR-FTIR dan SEM-EDX. Optimasi kondisi yang dilakukan, meliputi kondisi pH, massa adsorben, durasi kontak, dan pengaruh konsentrasi adsorbat yang diolah lebih lanjut untuk menentukan model kinetika dan isotherm adsorpsi.

Hasil penelitian mengindikasikan bahwa modifikasi adsorben beads-kitosan menggunakan senyawa EPTAC telah berhasil dilakukan dengan hasil karakterisasi ATR-FTIR dan SEM-EDX, serta peningkatan kemampuan adsorpsi dibandingkan adsorben beads-kitosan tanpa modifikasi pada uji aktivitas. Adsorben beads optimal pada kondisi asam (pH 2), massa adsorben sebesar 0,05 gram, durasi kontak selama 90 menit, dan konsentrasi adsorbat sebesar 500 mg L^{-1} . Kajian model kinetika dan isotherm adsorpsi yang dilakukan pada penelitian menunjukkan proses adsorpsi mengikuti model kinetika orde 2 semu dan isotherm Langmuir.

Kata kunci: adsorben, adsorpsi, beads, kitosan, zat warna

***CHITOSAN-BASED BEADS MODIFIED WITH EPTAC
(Epoxypropyltrimethylammonium Chloride) AS AN ADSORBENT FOR
REMAZOL YELLOW FG DYE***

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ABSTRACT

A study on the adsorption activity of EPTAC-modified chitosan beads in adsorbing the dye Remazol Yellow FG (RYFG) has been conducted. This study aimed to modify chitosan with EPTAC and form it into adsorbent beads, followed by characterization, condition optimization, and an investigation of the adsorption kinetics and isotherm models. The modification was carried out by reacting chitosan with EPTAC under basic conditions resulting from the addition of sodium hydroxide (NaOH) solution for 24 hours. The formation of adsorbent beads was carried out by dissolving chitosan in a 1% acetic acid (CH_3COOH) solution, followed by the addition of glutaraldehyde, and the mixture was then dripped into the NaOH solution using a syringe. The modified chitosan adsorbent beads were characterized using ATR-FTIR and SEM-EDX. The optimization of conditions, including pH, adsorbent mass, contact duration, and the effect of adsorbate concentration, was further analyzed to determine the adsorption kinetics and isotherm models.

The results of the study indicate that the modification of chitosan beads using the EPTAC compound was successful, as evidenced by the ATR-FTIR and SEM-EDX characterization results, as well as an increase in adsorption capacity compared to unmodified chitosan beads in the activity test. The adsorbent beads performed optimally under acidic conditions (pH 2), with an adsorbent mass of 0.05 grams, a contact time of 90 minutes, and an adsorbate concentration of 500 mg L^{-1} . The kinetic and adsorption isotherm analyses conducted in this study indicated that the adsorption process followed a pseudo-second-order kinetic model and a Langmuir isotherm.

Keywords: adsorbent, adsorption, beads, chitosan, dye