

ADSORPSI ZAT WARNA *METHYLENE BLUE* MENGGUNAKAN KALIKS[4]RESORSINARENA

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ABSTRAK

Telah dilakukan pemanfaatan kaliks[4]resorsinarena untuk mengadsorpsi zat warna *Methylene Blue*. Adsorpsi dilakukan dengan menggunakan metode *batch* pada variasi pH awal, waktu kontak dan konsentrasi awal zat warna. Model kinetika Ho dan Lagergren digunakan untuk menentukan orde reaksi. Persamaan adsorpsi isoterm Langmuir dan Freundlich digunakan untuk menentukan jenis isoterm adsorpsinya. Banyaknya zat warna yang teradsorpsi ditentukan menggunakan spektrofotometer UV-Vis. Sebelum dan setelah adsorpsi, adsorben dikarakterisasi menggunakan FTIR.

Hasil adsorpsi optimum zat warna *Methylene Blue* oleh kaliks[4]resorsinarena terjadi pada pH 6, waktu kontak 30 menit. Order reaksi adsorpsi zat warna *Methylene Blue* oleh kaliks[4]resorsinarena adalah pseudo orde 2 dari model kinetika Ho yang menunjukkan korelasi terbaik terhadap data eksperimen dengan konstanta laju reaksi sebesar $4,5 \times 10^{-3}$ g/mg.menit. Isoterm adsorpsi *Methylene Blue* oleh kaliks[4]resorsinarena cenderung berkorelasi dengan isoterm adsorpsi Freundlich dengan kapasitas adsorpsi sebesar $4,1 \times 10^{-3}$ mol/g.

Kata Kunci : Adsorpsi, Kaliks[4]resorsinarena, *Methylene Blue*

ADSORPTION OF *METHYLENE BLUE* DYE USING CALIX[4]RECORCINARENE

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ABSTRACT

Adsorption of *Methylene Blue* had been conducted using calix[4]recorcinarene. The adsorption process was performed using batch method in which varying on initial pH, contact time, and initial dye concentration. Lagergren and Ho kinetic model were used to determine the reaction order. Langmuir and Freundlich adsorption isotherm equations were applied to determine the type of the adsorption isotherm. The concentration of adsorbed *Methylene Blue* dye were determined by using spectrophotometer UV-Vis. Before and after the adsorption, the adsorbent were characterized using FTIR.

The result showed that the optimum adsorption of *Methylene Blue* using calix[4]recorcinarene was in initial pH at 6 and contact time 30 minutes. The adsorption reaction order of *Methylene Blue* dye by calix[4]recorcinarene was pseudo-second-order of the Ho kinetic model that was provided the best correlation for experimental data with constant adsorption rate was $4,5 \times 10^{-3}$ g/mg.minute. The adsorption isotherm of *Methylene Blue* dye by calix[4]recorcinarene tended to relate to Freundlich adsorption isotherm with adsorption capacity was $4,1 \times 10^{-3}$ mol/g.

Key words: Adsorption, Calix[4]recorcinarene, *Methylene Blue*