DEKOLORISASI PEWARNA SINTETIK *REACTIVE BLACK 5* OLEH ENZIM LAKASE YANG DIIMOBILISASI PADA MATRIKS HIDROTON

HANIFAH
14/364401/PA/15980

INTISARI

Penelitian dekolorisasi pewarna sintetik *reactive black 5* oleh enzim lakase yang diimobilisasi pada matriks hidroton telah dilakukan. Penelitian ini bertujuan untuk mengisolasi enzim lakase dari jamur pelapuk putih (*Trametes polyzona*) dan mengimobilisasinya pada matriks hidroton, mengevaluasi dekolorisasi pewarna sintetik *reactive black 5* dengan enzim lakase, matriks hidroton dan matriks hidroton terimobilisasi enzim lakase serta mengetahui jenis isoterm adsorpsi dan kinetika enzim pada matriks hidroton.

Penelitian ini diawali dengan mengekstraksi enzim dari jamur *T. polyzona*, kemudian mengimobilisasi enzim lakase pada matriks hidroton yang telah dimodifikasi permukaannya menggunakan (3-Aminopropil)trietoksisilan (APTS) dan dengan glutaraldehida sebagai taut silang. Setelah itu, hasil yang didapat kemudian diuji dekolorisasi pewarna *reactive black 5* oleh enzim bebas, matriks hidroton dan matriks hidroton terimobilisasi enzim, serta diuji isoterm adsorpsi dan kinetika enzimnya.

Hasil penelitian menghasilkan ekstrak enzim kasar seberat 80,24 g dengan aktivitas enzim lakase sebesar 0,76 U/L dan telah berhasil terimobilisasi pada matriks hidroton. Persentase dekolorisasi pewarna sintetik *reactive black 5* dengan matriks hidroton sebesar 10,89%, enzim lakase sebesar 75,56%, matriks hidroton terimobilisasi enzim lakase sebesar 97,54%. Jenis isoterm adsorpsi sebelum imobilisasi mengarah pada model isoterm adsorpsi Freundlich dengan R^2 = 0,9971 dan isoterm adsorpsi sesudah imobilisasi enzim mengarah pada model isoterm adsorpsi Langmuir dengan R^2 = 0,9189. Kinetika enzim matriks hidroton terimobilisasi enzim V_{maks} adalah 0,00515 µmol/menit dan K_m adalah 277,29 mg/L.

Kata Kunci : dekolorisasi, enzim lakase, imobilisasi, matriks hidroton, *reactive black 5*

DECOLORIZATION OF SYNTHETIC DYES REACTIVE BLACK 5 BY LACCASE IMMOBILIZED IN HYDROTON

HANIFAH
14/364401/PA/15980

ABSTRACT

Study of decolorization of reactive black 5 synthetic dyes by laccase immobilized in hydroton has been conducted. The research were aimed to isolate the laccase enzyme from white fungus (*Trametes polyzona*) and to immobilize it in the hydroton matrix, to immobilize to evaluate the decolorization of synthetic dyes reactive black 5 with laccase enzyme, hydroton matrix and immobilized hydroton matrix of laccase enzyme and to learn about the adsorption isotherm types and enzyme kinetics on the hydroton matrix.

This research was begun with extracting enzyme from *T.Polyzona* fungus, then the laccase enzyme was immobilized in hydroton matrix whose surface has been modified using (3-Aminopropyl)triethoxysilane) (APTS) with glutaraldehyde as crosslinker. Furthermore, the result obtained was then tested for the decolorization of synthetic dye reactive black 5 by free enzyme, hydroton matrix and immobilized enzyme hydrotone matrix, and analyzed the adsorption isotherm and its enzyme kinetics.

The results of the experiment was a crude enzyme extract with weight of 80.24 g with laccase enzyme activity of 0.76 U/L and these enzyme successfully immobilized in the hydroton matrix. Percentage of reactive black 5 synthetic decolorization with hydroton matrix was 10,89%, 75,56% for laccase enzyme, and hydroton immobilized laccase was 97,54%. The type of adsorption isotherm hydroton matrix was indicated to the Freundlich adsorption isotherm with R^2 = 0.9971 and the adsorption isotherm after enzyme immobilization hydroton matrix was indicated to the Langmuir adsorption isotherm with R^2 = 0.9189. The kinetics of immobilized hydrons enzyme was 0.00515 µmol/menit for V_{max} and 277.29 mg/L for K_m.

Keywords: immobilization, decolorization, hydroton matrix, laccase enzyme, reactive black 5