

## **SINTESIS ASAM *O*-ASETILFERULAT, Uji INHIBISINYA TERHADAP ENZIM $\alpha$ -AMILASE DAN EFEK SINERGITASNYA DENGAN ETIL FERULAT**

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### **INTISARI**

Senyawa etil ferulat dan asam *o*-asetilferulat telah berhasil disintesis. Sintesis etil ferulat berlangsung melalui reaksi esterifikasi Fischer dengan bahan dasar asam ferulat dan etanol yang menggunakan katalis  $\text{HClO}_4$  dan di refluks selama 6 jam. Sintesis asam *o*-asetilferulat berlangsung melalui reaksi asetilasi dengan bahan dasar asam ferulat dan asetat anhidrida dengan katalis  $\text{NaHCO}_3$  dan dilakukan pengadukan pada suhu ruang selama 24 jam. Produk hasil sintesis dikarakterisasi menggunakan Kromatografi Lapis Tipis (KLT), *Gas Chromatography-Mass Spectrometer* (GC-MS), spektrometer *Fourier Transform Infrared* (FTIR), dan spektrometer *Nuclear Magnetic Resonance* (NMR).

Hasil penelitian menunjukkan senyawa etil ferulat dan senyawa asam *o*-asetilferulat telah berhasil disintesis dengan persen hasil yaitu masing-masing sebesar 92,7% dan 86,4%. Senyawa etil ferulat menunjukkan aktivitas inhibisi tertinggi pada konsentrasi 12,5 mM yaitu sebesar 96,8%. Senyawa asam *o*-asetilferulat menunjukkan aktivitas inhibisi tertinggi pada konsentrasi 12,5 mM yaitu sebesar 91,5%. Sinergitas kedua senyawa menunjukkan aktivitas inhibisi tertinggi pada konsentrasi 12,5 mM yaitu sebesar 99,7%.

**Kata kunci :**  $\alpha$ -amilase, asam *o*-asetilferulat, asetilasi, esterifikasi, etil ferulat.

***SYNTHESIS OF O-ACETYLFERULIC ACID, AND ITS INHIBITION  
AGAINST  $\alpha$ -AMYLASE AS WELL AS THE SYNERGISTIC EFFECT WITH  
ETHYL FERULATE***

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**ABSTRACT**

Ethyl ferulate and o-acetylferulic acid have been successfully synthesized. The synthesis of ethyl ferulate was carried out through the Fischer esterification reaction by refluxing ferulic acid and ethanol in the presence of  $\text{HClO}_4$  catalyst for 6 h. Meanwhile, the synthesis of o-acetylferulic acid takes place through an acetylation reaction of ferulic acid and acetic anhydride with a  $\text{NaHCO}_3$  catalyst at room temperature for 24 h. The synthesized product was characterized using Thin Layer Chromatography (TLC), Gas Chromatography-Mass spectrometer (GC-MS), Fourier Transform Infrared (FTIR) spectrometer, and Nuclear Magnetic Resonance (NMR) spectrometer.

The research results showed that ethyl ferulate and o-acetylferulic acid were obtained in 92.7% and 86.4%. Ethyl ferulate showed the highest inhibitory activity, at a concentration of 12.5 mM of 96.8%. O-acetylferulic acid compound showed the highest inhibitory activity at a concentration of 12.5 mM of 91.5%. The synergistic of the two compounds show the highest inhibitory activity of 99.7% at a concentration of 12.5 mM.

**Key words:** acetylation,  $\alpha$ -amylase, ethyl ferulate, esterification, o-acetylferulic acid.