

SINTESIS SENYAWA 3,4-DIMETOKSI-6-NITROKHALKON DAN 3,4-DIMETOKSIKHALKON SERTA UJI AKTIVITASNYA SEBAGAI ANTIOKSIDAN

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ABSTRAK

Telah dilakukan sintesis senyawa 3,4-dimetoksi-6-nitrokhalkon dan 3,4-dimetoksihalkon serta uji aktivitasnya sebagai antioksidan. Senyawa 6-nitroveratraldehida diperoleh dari hasil reaksi nitrasi senyawa veratraldehida dengan HNO_3 dan H_2SO_4 . Senyawa khalkon disintesis melalui reaksi kondensasi Claisen-Schmidt. Sintesis senyawa 3,4-dimetoksi-6-nitrokhalkon (khalkon **1**) dilakukan dengan mereaksikan asetofenon, 6-nitroveratraldehida dan katalis basa NaOH 8% dalam pelarut etanol selama 4 jam. Sintesis senyawa 3,4-dimetoksihalkon (khalkon **2**) dibuat dengan mereaksikan asetofenon dan veratraldehida dalam pelarut etanol menggunakan katalis KOH 13% selama 20 jam. Elusidasi struktur produk dilakukan menggunakan spektrofotometer FT-IR, DI-GC-MS, TLC Scanner, $^1\text{H-NMR}$ dan $^{13}\text{C-NMR}$. Senyawa khalkon hasil sintesis diuji aktivitas antioksidannya menggunakan metode DPPH dengan asam askorbat sebagai kontrol positif.

Produk sintesis nitrasi veratraldehida menghasilkan senyawa 6-nitroveratraldehida berupa padatan berwarna kuning dengan persentase hasil 86,77% dan titik leleh 110-113 °C. Sintesis senyawa khalkon **1** menghasilkan padatan berwarna hijau dengan persentase hasil 30,62% dan titik leleh 173-176 °C. Sintesis senyawa khalkon **2** menghasilkan padatan berwarna kuning dengan persentase hasil 48,97% dan titik leleh 78-79 °C. Hasil uji aktivitas antioksidan senyawa khalkon **1** dan khalkon **2** memiliki nilai IC_{50} berturut-turut 19,972 $\mu\text{g/mL}$ dan 31,177 $\mu\text{g/mL}$ yang dapat dikategorikan sebagai antioksidan kuat.

Kata kunci : antioksidan, asetofenon, khalkon, nitroveratraldehida.

SYNTHESIS OF 3,4-DIMETHOXY-6-NITROCHALCONE AND 3,4-DIMETHOXYCHALCONE COMPOUND AND ACTIVITY TEST AS ANTIOXIDANT

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ABSTRACT

Synthesis of 3,4-dimethoxy-6-nitrochalcone and 3,4-dimethoxychalcone compounds and activity test as antioxidant have been carried out. The 6-nitroveratraldehyde compound was obtained from the nitration reaction of veratraldehyde compound with HNO₃ and H₂SO₄. Synthesis of chalcone was carried out by Claisen-Schmidt condensation reaction. The 3,4-dimethoxy-6-nitrochalcone (chalcone **1**) compound was synthesized by reacting acetophenone, 6-nitroveratraldehyde and NaOH 8% catalyst in ethanol stirred for 4 hours. The 3,4-dimethoxychalcone (chalcone **2**) compound was synthesized by reacting acetophenone and veratraldehyde with ethanol as solvent using a KOH 13% catalyst stirred for 20 hours. Elucidation of product structure was performed using FT-IR spectrofotometer, DI-GC-MS, TLC Scanner, and ¹H-¹³C-NMR. The chalcone compound synthesized was tested for its antioxidant activity using DPPH method with ascorbic acid as positive control.

The veratraldehyde nitration synthesis produced 6-nitroveratraldehyde compound in the form of yellow solid with yield 86.77% and melting point 110-113 °C. Synthesis of chalcone **1** compound produced a green solid with yield 30.62% and melting point 173-176 °C. Synthesis of chalcone **2** compound produced a yellow solid with yield 48.97% and melting point 78-79 °C. The results of activity test for chalcone **1** and chalcone **2** as antioxidant gave IC₅₀ 19.972 µg / mL and 31.177 µg / mL respectively and both chalcones have activity as strong antioxidant.

Keyword : antioxidant, acetophenone, chalcone, nitroveratraldehyde.