

ABSTRACT

Curcumin as an active compound in turmeric plant (*Curcuma longa* L.) is known to have antioxidant activity. Research on curcumin being developed especially to synthesize curcumin derivatives compounds with better activity. The successfully synthesized compounds are PGV-0 into Tetrahidropentagamavunon-0 (THPGV-0) and PGV-1 into Tetrahidropentagamavunon-1 (THPGV-1). The antioxidant activities of THPGV-0 and THPGV-1 better than PGV-0 and PGV-1. This proves that the shape of Tetrahidrokurkumin can increase the activity. This research aims to synthesize the 2,6-bis-(3'-klorobenzil)-sikloheksanon (THA10) and Tetrahidrogamavuton-5 (THGVT-5) compounds, with the test of antioxidant activity.

2,6-bis-(3'-klorobenzil)-sikloheksanon (THA10) and Tetrahidrogamavuton-5 (THGVT-5) compounds synthesized by the hydrogenation method using a metal catalyst Pd / C, hydrogen gas (H₂), and methanol at room temperature. The synthesis products were separated by column chromatography, and then purified and calculated the amount of yield. Furthermore, the compounds were characterized using IR spectroscopy, GC-MS, ¹H-NMR and ¹³C-NMR. THA10 and THGVT-5 antioxidant activity test was conducted using DPPH radical capture power and reducing power to the ferric ion. Quantitative test result data in the form of percentage (%) of DPPH free radical scavenging and percentage (%) of FRAP (Ferric Reducing Antioxidant Power).

Based on the interpretation of spectroscopic data obtained by the fact that THA10 successfully synthesized. The synthesized of 2,6-bis-(3'-klorobenzil)-sikloheksanon (THA10) compound is white powder with a melting point of 44-45 ° C with a yield of 35.22% and BM 346.1 mg / mol. Tetrahidrogamavuton-5 (THGVT-5) did not successfully synthesized because it is not acquired the pure GVT-5 as the starting material. DPPH antioxidant test results and the reduction of ferric ion at a concentration of 1000 μM, show that THA10 have antioxidant activity is relatively better than the A10.

Keywords: THA10, THGVT-5, hydrogenation, DPPH, ferric ions.

INTISARI

Kurkumin sebagai senyawa aktif pada tanaman kunyit (*Curcuma longa* L.) diketahui memiliki aktivitas antioksidan. Penelitian tentang kurkumin terus dikembangkan terutama untuk mensintesis senyawa turunan kurkumin dengan aktivitas yang lebih baik. Senyawa yang berhasil disintesis antara lain PGV-0 dan PGV-1 menjadi Tetrahidropentagamavunon-0 (THPGV-0) dan Tetrahidropentagamavunon-1 (THPGV-1). Aktivitas antioksidan THPGV-0 dan THPGV-1 lebih baik daripada PGV-0 dan PGV-1. Hal ini membuktikan bahwa bentuk Tetrahidrokurkumin dapat meningkatkan aktivitas. Penelitian ini bertujuan untuk mensintesis senyawa 2,6-bis-(3'-klorobenzil)-sikloheksanon (THA10) dan Tetrahidrogamavuton-5 (THGVT-5), beserta uji aktivitas antioksidannya.

Senyawa 2,6-bis-(3'-klorobenzil)-sikloheksanon (THA10) dan Tetrahidrogamavuton-5 (THGVT-5) disintesis dengan metode hidrogenasi menggunakan katalis logam Pd/C, gas Hidrogen (H₂), dan pelarut metanol pada suhu kamar. Produk hasil sintesis dipisahkan dengan kolom kromatografi, kemudian dimurnikan dan dihitung besarnya rendemen. Selanjutnya senyawa dikarakterisasi menggunakan metode Spektroskopi IR, GC-MS, ¹H-NMR dan ¹³C-NMR. Uji aktivitas antioksidan THA10 dan THGVT-5 dilakukan dengan metode daya tangkap radikal DPPH dan daya reduksi terhadap ion feri. Data hasil uji kuantitatif berupa persen (%) penangkapan radikal bebas DPPH dan persen (%) FRAP (*Ferric Reducing Antioxidant Power*).

Berdasarkan hasil interpretasi data spektroskopi diperoleh fakta bahwa THA10 berhasil disintesis. Senyawa 2,6-bis-(3'-klorobenzil)-sikloheksanon (THA10) hasil sintesis berbentuk serbuk putih dengan titik lebur 44 – 45 °C dengan rendemen sebesar 35,22 % dan BM 346,1 mg/mol. Tetrahidrogamavuton-5 (THGVT-5) tidak berhasil disintesis karena tidak diperoleh GVT-5 murni sebagai *starting materialnya*. Hasil uji antioksidan DPPH dan reduksi ion feri pada konsentrasi 1000 µM, THA10 memiliki aktivitas antioksidan relatif lebih baik daripada A10.

Kata Kunci: THA10, THGVT-5, hidrogenasi, DPPH, ion ferri.