

Modifikasi Sinamaldehyd melalui reaksi Michael-Addition dengan menggunakan Katalis Bis[Prolinate-N,O]Zn = Modification of Cinnamaldehyde through Michael-addition reaction using a Bis[Prolinate-N,O]Zn Catalyst

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Abstrak

Senyawa turunan α -merkapto karbonil adalah senyawa yang mengandung ikatan C-S yang menunjukkan berbagai aktivitas biologis, seperti anti-bakteri, anti-mikroba, anti-jamur, anti-kanker, anti-trombotik, anti-oksidan, efek anti-diabetes dan agen potensial sitotoksik. Sintesis senyawa turunan α -merkapto karbonil dapat ditingkatkan efisiensinya dengan menggunakan katalis heterogen berbasis air berupa Bis[Prolinate-N,O]Zn atau Zn[Proline]₂. Dalam penelitian ini, modifikasi sinamaldehyd telah dilakukan dengan sintesis kalkon dan turunannya dan mereaksikannya dengan reagen merkaptan seperti 2-merkaptoetanol. Berdasarkan hasil optimasi reaksi, diperoleh kondisi optimum dengan menggunakan pelarut etanol. Yield yang didapatkan dalam kondisi optimum pada senyawa 2 sebesar 59,44%, senyawa 3 sebesar 66,22%, senyawa 4 sebesar 66,22%, dan senyawa 5 sebesar 59,88%. Produk hasil sintesis dan katalis Bis[Prolinate-N,O]Zn dikarakterisasi menggunakan Kromatografi Lapis Tipis (KLT), Spektrofotometer FT-IR, Spektrofotometer UV-Vis, dan GC-MS. Kalkon dan turunannya, serta produk hasil sintesis diuji aktivitas antioksidan dengan metode DPPH. Aktivitas antioksidan yang ditandai dengan nilai IC₅₀ untuk kalkon sebesar 9614,32 ppm, senyawa 2 sebesar 1378,25 ppm, 2-hidroksi kalkon sebesar 2569,74 ppm, senyawa 3 sebesar 581,47 ppm, 4-hidroksi-3-metoksi kalkon sebesar 1094,37 ppm, dan senyawa 5 sebesar

The α -mercapto carbonyl derivative is a compound containing C-S bonds which shows a variety of biological activities, such as anti-bacterial, anti-microbial, anti-fungal, anti-cancer, anti-thrombotic, anti-oxidant, anti-diabetic effects and potential cytotoxic agents. Synthesis of α -mercapto carbonyl derivative compounds can be increased in time efficiency using a water-based heterogeneous catalyst in the form of Bis [Prolinate-N, O] Zn or Zn[Proline]₂. In this study, chalcone and cinnamaldehyde were modified with mercaptan reagents such as 2-mercaptoethanol. Based on the results of the optimization of the reaction, the optimum conditions are obtained by using ethanol as a solvent. Yield obtained in optimum conditions at compound 2 was 59.44%, compound 3 was 66.22%, compound 4 was 66.22%, and compound 5 was 59.88%. The Zn[Proline]₂ catalysts and the product were characterized using Thin Layer Chromatography (TLC), FT-IR spectrophotometer, UV-Vis spectrophotometer, and GC-MS. Chalcone and derivatives, as well as synthesized products were tested for antioxidant activity by the DPPH method. Antioxidant activity is characterized by IC₅₀ values for chalcone of 9614.32 ppm, compound 2 of 1378.25 ppm, 2-hydroxy chalcone of 2569.74 ppm, compound 3 of 581.47 ppm, 4-hydroxy-3-methoxy chalcone of 1094.37 ppm, and compound