

Pemanfaatan senyawa Aldehida Aromatik Sinamaldehida untuk sintesis senyawa turunan Tiazolidin berbasis 3-Asetilpiridin sebagai aenyawa antioksidan = Utilization of cinnamaldehyde for the synthesis of 3-Acetylpyridine-Based thiazolidine derivatives and bioactivity test as antioxidant

Muhamad Naufal, author

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Abstrak

Senyawa turunan tiazolidin merupakan senyawa heterosiklik dengan atom nitrogen dan sulfur dalam struktur cincinnya yang dikenal memiliki aktivitas biologis, yaitu antioksidan, antitumor, anti-inflamasi, antimikorba, dan anti-hiperglikemia. Pada penelitian kali ini akan dilakukan sintesis senyawa turunan tiazolidin yang berasal dari 3-asetilpiridin dan memiliki substituen aldehid aromatik dari senyawa sinamaldehyd, benzaldehyd, dan 4-hidroksi benzaldehyd. Produk senyawa turunan tiazolidin ini diidentifikasi menggunakan KLT dan uji titik leleh, serta dikarakterisasi menggunakan spektrofotometer Ultraviolet-Visible (UV-Vis), Fourier Transform Infrared spectroscopy (FTIR), dan Liquid Chromatography Mass Spectrometry (LC-MS). Senyawa yang terbentuk dilakukan pengujian aktivitas antioksidan dengan menggunakan metode DPPH. Pada penelitian ini didapatkan produk 3-asetilpiridin tiosemikarbazon dengan persen rendemen sebesar 73,83%, 3-asetilpiridin tiazolidin-4-on sebesar 38,39%. turunan 3-asetilpiridin tiazolidin-4-on sinamaldehyd sebesar 4,61%, turunan 3-asetilpiridin tiazolidin-4-on benzaldehyd sebesar 15,82%, dan turunan 3-asetilpiridin tiazolidin-4-on 4-hidroksi benzaldehyd sebesar 21,42%. Kemampuan antioksidan senyawa ditinjau dari nilai IC₅₀ dimana senyawa 3-asetilpiridin tiazolidin-4-on sebesar 452,11 ppm, turunan 3-asetilpiridin tiazolidin-4-on sinamaldehyd sebesar 1553,52 ppm, turunan 3-asetilpiridin tiazolidin-4-on benzaldehyd sebesar 3484,42 ppm, dan turunan 3-asetilpiridin tiazolidin-4-on 4-hidroksi benzaldehyd sebesar 1542,78 ppm.

.....Thiazolidine derivative compounds are heterocyclic compounds with nitrogen and sulfur atom in their ring structure which are known to have biological activities, such as antioxidant, antitumor, anti-inflammatory, antimicrobial, and anti-hyperglycemic. In this study, the synthesis of thiazolidine derivatives derived from 3-acetylpyridine and aromatic aldehyde substituents from cinnamaldehyde, benzaldehyde, and 4-hydroxy benzaldehyde compounds will be carried out. Thiazolidine derivative product was identified using TLC and melting point test, and characterized using Ultraviolet-Visible (UV-Vis) spectrophotometer, Fourier Transform Infrared spectroscopy (FTIR), and Liquid Chromatography Mass Spectrometry (LC-MS). The compounds formed were tested for antioxidant activity using the DPPH method. In this study, 3-acetylpyridine thiosemicarbazone was obtained with a yield 73.83%, 3-acetylpyridine thiazolidine-4- one were 38.39%. the 3-acetylpyridine thiazolidine-4-one derivative of cinnamaldehyde were 4.61%, the 3-acetylpyridine thiazolidine-4-one benzaldehyde derivative were 15.82%, and the 3-acetylpyridine thiazolidine-4-one 4-hydroxy benzaldehyde derivative were 21.42 %. The antioxidant ability of the compound was assessed from the IC₅₀ value where the 3-acetylpyridine thiazolidine-4-one compound was 452.11 ppm, 3- acetylpyridine thiazolidine-4-one derivative of cinnamaldehyde was 1553.52 ppm, 3-acetylpyridine thiazolidine-4-one derivative of benzaldehyde was 3484.42 ppm, and derivatives of 3-acetylpyridine thiazolidine-4-one 4-hydroxy benzaldehyde was 1542.78 ppm.