Sintesis dan Aktivitas Antioksidan Senyawa Turunan Spiro[indol-tiazolodinon] Berbasis Isatin dengan Metode One-Pot Synthesis = One-pot Synthesis and Antioxidant Activity of Spiro[Indole-Thiazolidinone] Derivatives Based on Isatin

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Abstrak

Senyawa turunan indol dan tiazolidin memiliki bioaktivitas yang luas. Salah satunya adalah aktivitas antioksidan. Pada penelitian ini, dilakukan sintesis senyawa turunan spiro[indol-tiazolidinon] menggunakan amina primer, asam tioglikolat, serta asam oksalat sebagai katalis. Reaksi ini dilakukan dengan metode one-pot synthesis dengan cara Multi Component Reaction (MCR) dan menggunakan variasi amina primer, yaitu anilin, 4-nitroanilin, dan 4-aminofenol untuk masing-masing senyawa turunan spiro[indol-tiazolidinon] 1, 2, dan 3. Senyawa hasil sintesis dikarakterisasi menggunakan Kromatografi Lapis Tipis (KLT), uji titik leleh, serta analisis menggunakan Ultra Violet-Visible Spectroscopy (UV-Vis), Fourier-Transform Infrared Spectroscopy (FTIR), dan Liquid Chromatography–Mass Spectrometry (LC-MS). Didapatkan senyawa spiro[indol-tiazolidinon] 1, 2, dan 3 dengan persen yield masing-masing sebesar 15,64%; 12,179%; 19,36%. Kemudian produk yang disintesis dilakukan uji antioksidan menggunakan metode 1,1-difenil-2-pikrihidazil (DPPH). Hasil uji menunjukkan bahwa seluruh senyawa turunan spiro[indol-tiazolidinon] memiliki aktivitas antioksidan dengan nilai IC50 senyawa spiro[indol-tiazolidinon] 1, 2, dan 3 masing-masing sebesar 692,90; 683,88; dan 667,32 ppm.

.....Indole and thiazolidine derivatives have diverse bioactivities, one of them is an antioxidant. In this research, spiro[indole-thiazolidinone] derivatives were prepared by a one-pot synthesis method. This Multi-Component Reaction (MCR) consisted of isatin, primary amine, and thioglycolic acid, with the addition of oxalic acid as a catalyst. Aniline, 4-nitroaniline, and 4-aminophenol were used as the variation of primary amine for the preparation of spiro[indole-thiazolidinone] 1, 2, and 3 respectively. After preparation, spiro[indole-thiazolidinone] derivatives were identified using Thin-Layer Chromatography (TLC), melting point, and were analyzed using Ultra Violet-Visible Spectroscopy (UV-Vis), Fourier-Transform Infrared Spectroscopy (FTIR), dan Liquid Chromatography–Mass Spectrometry (LC-MS). Percent yield of spiro[indole-thiazolidinone] 1, 2, and 3 were 15.64%; 12.179%; and 19.36% respectively. The antioxidant activity of the compounds was tested using DPPH method. IC50 value of spiro[indole-thiazolidinone] 1, 2, and 3 respectively were 692.90; 683.88; and 667.32 ppm.