Pemanfaatan Sinamaldehida untuk Sintesis Senyawa Berbasis Azina dan Uji Antioksidan = Utilization of Cinnamaldehyde for the Synthesis of Azine-based Compounds and Their Antioxidant Activity

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Abstrak

Isatin (1H-indole-2,3-dione) merupakan senyawa heterosiklik turunan indol yang dapat ditemukan di tumbuhan seperti Isatis tinctoria, Calanthe discolor dan Couroupita guianensi. Isatin dan derivatnya memiliki aktivitas biologis dan farmakologis yang baik. Senyawa derivat isatin berbasis azina telah ditemukan memiliki berbagai bioaktivitas, seperti antibakteri, antijamur, antikanker, antivirus, antiinflamasi, antioksidan, dan sebagai inhibitor korosi. Pada penelitian ini telah dilakukan sintesis derivat isatin aldazin menggunakan variasi aldehid aromatik benzaldehida, 4-hidroksibenzaldehida, dan sinamaldehida sebagai prekursornya. Sintesis ini dilakukan dengan menggunakan katalis protic ionic liquid 1-metilimidazolium hidrogen sulfat [MIM][HSO4] untuk efisiensi waktu. Berdasarkan hasil optimasi diperoleh jumlah katalis dengan kondisi optimum reaksi sebesar 10% mol. Hasil sintesis senyawa isatin aldazin 1 diperoleh persen yield sebesar 84,83%, senyawa isatin aldazin 2 sebesar 50,82%, dan senyawa isatin aldazin 3 sebesar 88,61%. Keberhasilan sintesis diidentifikasi dan dikarakterisasi menggunakan uji titik leleh, kromatografi lapis tipis (KLT), FTIR, UV-Visible, LC-MS/MS, GC-MS, dan NMR. Potensi aktivitas antioksidan senyawa isatin aldazin ditinjau menggunakan metode DPPH dan diperoleh nilai IC50 senyawa isatin aldazin 1 sebesar 4848,84 ppm, isatin aldazin 2 sebesar 15,54 ppm, dan isatin aldazin 3 sebesar 210,32 ppm.
.....Isatin (1H-indole-2,3-dione) is an indole derivative heterocyclic compound that can be found in plants such as Isatis tinctoria, Calanthe discolor, and Couroupita guianensis. Isatin and its derivatives have good biological and pharmacological activities. Azine-based isatin derivative compounds have been found to have various bioactivities, such as antibacterial, antifungal, anticancer, antiviral, anti-inflammatory, antioxidant, and corrosion inhibitor. In this study, the synthesis of isatin aldazine derivatives has been carried out using a variety of aromatic aldehydes benzaldehyde, 4-hydroxybenzaldehyde, and cinnamaldehyde as precursors. This synthesis was carried out using a protic ionic liquid 1-methylimidazolium hydrogen sulfate [MIM][HSO4] catalyst for time efficiency. Based on the optimization results, the amount of catalyst with the optimum reaction conditions was 10% mol. The yield obtained from isatin aldazine 1 compound was 84.83%, isatin aldazine 2 compound was 50.82%, and isatin aldazine 3 compound was 88.61%. The formations were identified and characterized using melting point tests, thin layer chromatography (TLC), FTIR, UV-Visible, LC-MS/MS, GC-MS, and NMR. The potential antioxidant activity of the isatin aldazine compounds was evaluated using the DPPH method. The IC50 value of isatin aldazine 1 was 4848.84 ppm, isatin aldazine 2 was 15.54 ppm, and isatin aldazine 3 was 210.32 ppm.