

SYNTHESIS AND CHARACTERISATION OF 2'-AMINOCHALCONES, AND 1,4-BIS(2-AMINOPHENYL)-2- PHENYLBUTANE-1,4-DIONE DERIVATIVES

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ABSTRACT

Synthesis of 2'-aminochalcone derivatives from 2'-aminoacetophenone and a variety of aldehydes through a Claisen-Schmidt reaction had been carried out. Further reaction of the said 2'-aminochalcones with 2-oxindole had also been done to obtain 1,4-bis(2-aminophenyl)-2-phenylbutane-1,4-dione derivatives through a Michael-addition-oxidation-ring cleavage process.

The synthesis of 2'-aminochalcones was done by reacting 2'-aminoacetophenone with different aldehydes, namely benzaldehyde, 4-chlorobenzaldehyde, thiophene-2-carbaldehyde, and 4-methoxybenzaldehyde with the presence of sodium hydroxide (NaOH) in ethanol at room temperature for 18 h to produce (*E*)-1-(2-aminophenyl)-3-phenylprop-2-en-1-one (**3a**), (*E*)-1-(2-aminophenyl)-3-(4-chlorophenyl)prop-2-en-1-one (**3b**), (*E*)-1-(2-aminophenyl)-3-(thiophen-2-yl)prop-2-en-1-one (**3c**), and (*E*)-1-(2-aminophenyl)-3-(4-methoxyphenyl)prop-2-en-1-one (**3d**), respectively. 2'-aminochalcones **3a-d** were further reacted with 2-oxindole in the presence of NaOH in dimethyl sulfoxide (DMSO) at room temperature for 5-6 h to give compounds **5a-d**, namely 1,4-bis(2-aminophenyl)-2-phenylbutane-1,4-dione (**5a**), 1,4-bis(2-aminophenyl)-2-(4-chlorophenyl)butane-1,4-dione (**5b**), 1,4-bis(2-aminophenyl)-2-(thiophen-2-yl)butane-1,4-dione (**5c**), and 1,4-bis(2-aminophenyl)-2-(4-methoxyphenyl)butane-1,4-dione (**5d**). All of the synthesized products were characterized by using ¹H- and ¹³C-NMR, FTIR or FT-NSI spectrometers.

From the synthesis of 2'-aminochalcone derivatives, chalcones **3a-d** had been successfully synthesized with the percentage yield of 62.3, 86.2, 72.9, and 41.6%, respectively. Furthermore, 1,4-diones **5a-d** had also been successfully produced from Michael's addition reaction of chalcones **3a-d** and 2-oxindole in percentage yields of 42.4, 46.2, 57.1, and 35.3, respectively.

Keywords: 1,4-dione, chalcone, Michael-addition, 2-oxindole

SINTESIS DAN KARATERISASI SENYAWA TURUNAN 2'-AMINOKALKON DAN 1,4-BIS(2-AMINOFENIL)-2- FENILBUTANA-1,4-DION

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INTISARI

Sintesis turunan 2'-aminokalkon dari 2-aminoasetofenon dan beberapa macam aldehida melalui reaksi Claisen-Schmidt telah dilakukan. Reaksi dari turunan 2'-aminokalkon tersebut dengan 2-oksindol juga telah dilakukan untuk memperoleh turunan 1,4-bis(2-aminofenil)-2-fenilbutana-1,4-dion melalui proses adisi Michael-oksidasi-pembelahan cincin.

Sintesis 2'-aminokalkon dilakukan dengan mereaksikan 2'-aminoasetofenon dan aldehida yang berbeda, yaitu benzaldehida, 4-klorobenzaldehida, tiofena-2-karbaldehida, dan 4-metoksibenzaldehida dengan adanya natrium hidroksida (NaOH) dalam etanol pada suhu ruangan selama 18 jam untuk menghasilkan berturut-turut senyawa (*E*)-1-(2-aminophenyl)-3-phenylprop-2-en-1-one (**3a**), (*E*)-1-(2-aminophenyl)-3-(4-chlorophenyl)prop-2-en-1-one (**3b**), (*E*)-1-(2-aminophenyl)-3-(thiophen-2-yl)prop-2-en-1-one (**3c**), dan (*E*)-1-(2-aminophenyl)-3-(4-methoxyphenyl)prop-2-en-1-one (**3d**). 2'-Aminokalkon **3a-d** selanjutnya direaksikan dengan 2-oksindol dengan adanya NaOH dalam dimetil sulfoksida (DMSO) pada suhu ruangan selama 5-6 jam untuk menghasilkan senyawa **5a-d**, yaitu 1,4-bis(2-aminophenyl)-2-phenylbutane-1,4-dione (**5a**), 1,4-bis(2-aminophenyl)-2-(4-chlorophenyl)butane-1,4-dione (**5b**), 1,4-bis(2-aminophenyl)-2-(thiophen-2-yl)butane-1,4-dione (**5c**), dan 1,4-bis(2-aminophenyl)-2-(4-methoxyphenyl)butane-1,4-dione (**5d**). Semua produk yang disintesis dikarakterisasi dengan menggunakan ¹H- dan ¹³C-NMR, FTIR atau FT-NSI spektrometer.

Dari sintesis turunan 2'-aminokalkon, kalkon **3a-d** telah berhasil disintesis dengan persentase hasil berturut-turut 62,3, 86,2, 72,9, dan 41,6%. Selanjutnya, reaksi Michael adisi terhadap kalkon **3a-d** dan 2-oksindol juga telah dilakukan menghasilkan senyawa 1,4-dione **5a-d** dengan persentase hasil masing-masing 42,4, 46,2, 57,1, dan 35,3%.

Kata kunci: 1,4-dion, kalkon, Michael-adisi, 2-oksindol