

ABSTRAK

OPTIMASI JUMLAH NAOH DAN WAKTU SINTESIS 4'- METOKSIKALKON DARI 4'-METOKSIASETOFENON DAN BENZALDEHID

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Latar Belakang: Senyawa 4'-metoksikalkon merupakan senyawa turunan kalkon yang dapat diperoleh melalui sintesis dengan metode kondensasi Claisen-Schmidt. Dibutuhkan jumlah katalis NaOH dan waktu sintesis yang tepat untuk mendapatkan rendemen yang tinggi. Optimasi dengan *Response Surface Methodology* (RSM) dipilih untuk mendapatkan prediksi jumlah NaOH dan waktu sintesis optimum. Penelitian ini bertujuan untuk mengetahui kondisi optimum jumlah NaOH optimum dan waktu sintesis optimum dalam sintesis 4'-metoksikalkon.

Metodologi: Penelitian ini meliputi pembuatan rancangan percobaan menggunakan *Response Surface Methodology* (RSM) dengan matriks *Central Composite Design* (CCD) pada *Software Design Expert Version 12*. Sintesis senyawa 4'-metoksikalkon dilakukan sebanyak 13 percobaan. Hasil sintesis dianalisis menggunakan *Software*. Prediksi kondisi optimum yang didapatkan diverifikasi di laboratorium. Senyawa hasil sintesis diidentifikasi dan uji kemurnian dengan KLT dan Spektrofotometri UV.

Hasil Penelitian: Prediksi kondisi optimum yaitu jumlah NaOH 5,128 mmol dan waktu sintesis 17,584 menit dengan prediksi rendemen berdasarkan *Software* sebesar 93,787%. Hasil verifikasi kondisi optimum sebanyak tiga kali replikasi mendapatkan rendemen sebesar 96,05%; 96,75%; dan 96,51%.

Kesimpulan: Kondisi optimum yang diperoleh adalah jumlah NaOH 5.128 mmol dan waktu sintesis 17,584 menit dengan rendemen sebesar 96,44%.

Kata Kunci: 4'-metoksikalkon, sintesis kalkon, optimasi, *Response Surface Methodology*, *Software Design Expert*.

ABSTRACT

OPTIMIZATION OF NaOH AND SYNTHESIS TIME OF 4'-METHOXYCHALCONE FROM 4'-METHOXYACETOPHENONE AND BENZALDEHYDE

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Background: 4'-methoxychalcone is chalcone derivative which can be obtained by synthesis using the Claisen-Schmidt condensation method. It takes the right amount of NaOH as catalyst and synthesis time to get high yields. Optimization with Response Surface Methodology (RSM) was chosen to get the prediction of the optimum amount of NaOH and synthesis time. This study aims to determine the optimum conditions for the optimum amount of NaOH and the optimum synthesis time in the synthesis of 4'-methoxychalcone.

Methods: This research included making an experimental design using Response Surface Methodology (RSM) with a matrix of Central Composite Design (CCD) on Software Design Expert Version 12. The synthesis of 4'-methoxychalcone was carried out in 13 experiments. Synthesis results were analyzed using software. The prediction of the optimum conditions obtained is verified in the laboratory. The synthesized compound was identified and purity test by TLC and UV Spectrophotometry.

Results: The prediction of the optimum condition is NaOH 5,128 mmol and the synthesis time of 17,584 minutes with a prediction of yield based on software of 93,787%. The results of the verification of the optimum conditions for three replications obtained a yield of 96.05%; 96.75%; and 96.51%.

Conclusion: The optimum conditions were NaOH 5,128 mmol and the synthesis time of 17,584 minutes with a yield of 96.44%.

Keywords: 4'-methoxychalcone, chalcone synthesis, optimization, Response Surface Methodology, Software Design Expert.