

# SYNTHESIS OF THE COMPOUND 2,6-BIS-((E)-4-HYDROXY-3-METHOXYBENZYLIDINE)CYCLOHEXANONE WITH ENVIRONMENTALLY FRIENDLY ALDOL CONDENSATION AND TESTED ITS POTENTIAL AS ANTIOXIDANTS

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## ABSTRACT

The compound 2,6-bis-((E)-4-hydroxy-3-methoxybenzylidene)cyclohexanone is an analogue of curcumin. The purpose of this study was to synthesize and characterize the compound 2,6-bis-((E)-4-hydroxy-3-methoxybenzylidene)cyclohexanone with various moles of NaOH and then tested its potential as an antioxidant.

The compound 2,6-bis-((E)-4-hydroxy-3-methoxybenzylidene)cyclohexanone was synthesized from the reaction between vanillin (0.03 mol) and cyclohexanone (0.015 mol) with NaOH catalyst through the Claisen-Schmidt reaction using grinding technique. The variation of moles of NaOH used is 0.015 mol; 0.03 moles; 0.045 moles; and 0.06 moles. The synthesized compounds were identified and characterized using TLC, TLC Scanner, FT-IR spectroscopy, <sup>1</sup>H-NMR, <sup>13</sup>C-NMR and tested for their potential as antioxidants.

The results showed that the synthesized compound obtained was in the form of a yellow-orange (orange) solid with an R<sub>f</sub> value of 0.66 – 0.67. The results of the synthesis of compounds in the variation of NaOH 0.015 mol; 0.03 moles; 0.045 moles; and 0.06 moles respectively resulted in a yield of 46.21%; 53.16%; 93.48% and 103.59%. The largest yield was produced at a NaOH concentration of 0.06 mol. The synthesized compound after being characterized using FT-IR spectroscopy, <sup>1</sup>H-NMR spectroscopy, and <sup>13</sup>C-NMR spectroscopy still shows the basic ingredient of vanillin compounds. The results of the activity as an antioxidant test showed that the synthesized compound had very strong antioxidant activity with an IC<sub>50</sub> value of 21.56 g/mL and an AAI of 2.32.

Kata Kunci: *vanillin, cyclohexanone, curcumin analog compound, antioxidant*