



SINTESIS N-BENZIL-4-METOKSISINAMAMIDA DAN UJI AKTIVITASNYA SEBAGAI KANDIDAT SENYAWA TABIR SURYA

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INTISARI

Telah dilakukan sintesis senyawa turunan amida sinamat (sinamamida) berbahan dasar 4-metoksisinamat dengan benzilamina. Tujuan penelitian ini adalah untuk mendapatkan metode alternatif sintesis 4-metoksisinamat, sintesis *N*-benzil-4-metoksisinamamida dan mempelajari potensi turunan sinamamida sebagai kandidat senyawa tabir surya.

Sintesis turunan sinamat dilakukan dengan mereaksikan asam malonat dan 4-metoksibenzaldehida melalui reaksi kondensasi Knoevenagel dalam pelarut basa dimetilformamida dan katalis trietilamina menggunakan metode refluks selama 5 jam. Sintesis senyawa turunan sinamamida dilakukan melalui reaksi amidasi senyawa 4-metoksisinamat dengan benzilamina dalam pelarut toluena dan penambahan katalis asam borat ($B(OH)_3$) 5% mol menggunakan metode refluks dan apparatus *Dean-Stark Trap* selama 10 jam. Struktur senyawa hasil sintesis dielusidasi dengan spektrometer FT-IR, GC-MS, DI-MS, dan 1H -NMR. Senyawa turunan sinamamida hasil sintesis diuji aktivitasnya sebagai tabir surya menggunakan spektrofotometer UV-Vis dan ditentukan nilai SPFnya.

Hasil penelitian menunjukkan senyawa 4-metoksisinamat berupa padatan berbentuk jarum berwarna putih dengan rendemen 92% dengan titik leleh 172-173 °C. Pada senyawa *N*-benzil-4-metoksisinamamida diperoleh padatan berbentuk serbuk berwarna putih dengan rendemen 78% dengan titik leleh 123-125 °C. Hasil uji aktivitas tabir surya senyawa *N*-benzil-4-metoksisinamamida memiliki λ_{maks} pada kisaran serapan sinar UV-B, yaitu 293 dan 308 nm dan memiliki nilai SPF sebesar 34,28 pada konsentrasi 25 $\mu g/mL$ yang dapat dikategorikan sebagai kandidat tabir surya proteksi tinggi (*high protection*).

Kata kunci: Sinamamida, tabir surya, kondensasi Knoevenagel, amidasi.



***SYNTHESIS N-BENZYL-4-METHOXYCINNAMAMIDE
AND ITS ACTIVITY TEST AS CANDIDATE
OF SUNSCREEN COMPOUND***

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ABSTRACT

Synthesis of cinnamic amide (cinnamamide) derivative based on 4-methoxycinnamic with malonic acid have been conducted. The objectives of this research were to obtain an alternative method to synthesis of 4-methoxy cinnamic, synthesis *N*-benzyl-4-methoxycinnamamide, and to study the potential of cinnamamide derivatives as candidate of sunscreen compound.

Synthesis of cinnamic derivative was conducted using 4-methoxy benzaldehyde with malonic acid through Knoevenagel condensation reaction in dimethylformamide base solvent and triethylamine catalyst under reflux condition for 5 hours. Synthesis of the cinnamamide derivative compound was performed through amidation by refluxing with Dean-Stark Trap of 4-methoxycinnamic compound with benzylamine in toluene solvent and using boric acid (B(OH)₃) 5% mol catalyst for 10 hours. The structures of the products were elucidated by FT-IR spectrometer, GC-MS spectrometer, DI-MS spectrometer, and ¹H-NMR. The cinnamamide derivative product was tested for its activity as a sunscreen by UV-Vis spectrophotometer and its SPF value was determined.

The results showed that 4-methoxycinnamic was obtained as white needle solid with a yield of 92% and melting point 172-173 °C. Meanwhile, *N*-benzyl-4-methoxycinnamamide was obtained as white powder solids with a yield of 78% and melting point of 123-125 °C. The results of sunscreen activity test of the *N*-benzyl-4-methoxycinnamamide have λ_{max} in the range of UV-B rays, 293 and 308 nm and have SPF values of 34.28 at a concentration of 25 $\mu\text{g} / \text{mL}$ which can be categorized as a high protection sunscreen compound.

Keywords: Cinnamamide, sunscreen, Knoevenagel condensation, amidation.