SINTESIS (*Z*)-3-BENZILIDENISOINDOLINON MELALUI REAKSI *ONE-POT*

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INTISARI

Telah dipelajari sintesis (*Z*)-3-benzilidenisoindolinon berbahan dasar amonium asetat melalui reaksi *one-pot*. Tujuan dari penelitian ini untuk melakukan sintesis 3-benzilidenftalida melalui reaksi kopling Sonogashira dan mensintesis (*Z*)-3-benzilidenisoindolinon melalui reaksi dua tahap dan reaksi *one-pot* yang terdiri dari reaksi adisi nukleofilik dan *β*-eliminasi.

Penelitian ini dilakukan dengan mensintesis 3-benzilidenftalida dari asam 2-iodobenzoat, fenilasetilena, terkatalis CuI pada temperatur ruang selama 24 jam. Selanjutnya, sintesis (*Z*)-3-benzilidenisoindolinon dilakukan melalui reaksi dua tahap dan reaksi *one-pot*. Sintesis (*Z*)-3-benzilidenisoindolinon melalui reaksi dua tahap dilakukan dengan mereaksikan 3-benzilidenftalida dan amonium asetat melalui reaksi adisi nukleofilik menghasilkan 3-benzil-3-hidroksiisoindolinon. Selanjutnya, 3-benzil-3-hidroksiisoindolinon direaksikan dengan HCl 6M melalui reaksi *β*-eliminasi menghasilkan (*Z*)-3-benzilidenisoindolinon. Sedangkan, sintesis (*Z*)-3-benzilidenisoindolinon melalui reaksi *one-pot* dilakukan dengan menggabungkan reaksi adisi nukleofilik dan *β*-eliminasi dilakukan dalam satu wadah. Produk hasil dikarakterisasi dengan titik lebur, spektrometer ^{1}H-NMR, ^{13}C-NMR, dan FTIR.

Hasil penelitian menunjukkan bahwa 3-benzilidenftalida berhasil disintesis melalui reaksi kopling Sonogashira dengan persen hasil sebesar 64%. Sintesis (*Z*)-3-benzilidenisoindolinon melalui reaksi dua tahap berhasil disintesis dengan persen hasil reaksi adisi eliminasi dan *β*-eliminasi masing masing sebesar 70% dan 77%, sehingga persen hasil total dari reaksi dua tahap yaitu 54%. Produk (*Z*)-3-benzilidenisoindolinon berhasil disintesis melalui reaksi *one-pot* dan diperoleh persen hasil sebesar 73%. Dengan membandingkan persen hasil reaksi dua tahap dan reaksi *one-pot* didapatkan bahwa sintesis (*Z*)-3-benzilidenisoindolinon melalui reaksi one-pot lebih baik. Reaksi *one-pot* terbukti efektif, efisien, dan menerapkan prinsip *green chemistry*.

Kata kunci : turunan isoindolinon, *one-pot*, kopling Sonogashira, adisi nukleofilik, dan β-eliminasi.

SYNTHESIS OF (*Z*)-3-BENZYLIDENISOINDOLINONE *VIA* ONE-POT REACTION

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ABSTRACT

Synthesis of (Z)-3-benzylidenisoindolinone from ammonium acetate via one-pot reaction has been studied. The objectives of this research were to synthesize 3-benzylidenphtalide via Sonogashira coupling and to synthesize (*Z*)-3-benzylidenisoindolinone through two-step of reaction and one-pot reaction comprising nucleophilic addition and β-elimination reactions.

This research was initially conducted by synthesizing 3-benzylidenphtalide from 2-iodobenzoic acid, phenylacetylene, in the present CuI catalyzed at room temperature for 24 h. Synthesis (*Z*)-3-benzylidenisoindolinone was conducted by two methods. Synthesis of (*Z*)-3-benzylidenisoindolinone through a two-stage reaction was carried out by reacting 3-benzylidenftalide and ammonium acetate through nucleophilic addition reactions to produce 3-benzyl-3-hydroxyisoindolinone. Next, β-elimination reaction was performed by heating 3-benzyl-3-hydroxyisoindolinone with HCl 6M to give (*Z*)-3-benzylidenisoindolinone. In one-pot reaction, the nucleophilic addition and β-elimination reactions were performed in one-pot fashion. The products ware characterized by melting point analysis, ^{1}H-NMR, ^{13}C-NMR, and FTIR spectrometers.

The results showed that 3-benzilidenphtalide was synthesized *via* the Sonogashira coupling reaction in 64% yield. Synthesis of 3-benzylidenisoindolinone *via* two-step reaction was conducted with the yield of the nucleophilic addition and β-elimination reactions were of 70% and 77%, respectively. The total yield of (*Z*)-3-benzylidenisoindolinone synthesis through two-step reaction was 54% yield. The (*Z*)-3-benzylidenisoindolinone was obtained through a one-pot reaction in 73% yield. By comparing the yield of the two-step reaction and the one-pot reaction, the latter gave desired product in higher yield. One-pot reaction is proven to be effective, efficient, and apply the principles of green chemistry.

Keywords: isoindolinone derivative, one-pot, Sonogashira coupling, nucleophilic addition, and β-elimination.