SINTESIS TURUNAN KHALKON DARI 2,4-DIHIDROKSIASETOFENON DENGAN VANILIN TERHALOGENASI DAN UJI AKTIVITASNYA SEBAGAI ANTIOKSIDAN

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INTISARI

Sintesis dan uji aktivitas antioksidan telah dilakukan untuk 3-kloro-4-hidroksi-5-metoksibenzaldehida (senyawa **1**), 3-bromo-4-hidroksi-5-metoksibenzaldehida (senyawa **2**), 2',4'-dihidroksi- 3-kloro-4-hidroksi -5-metoksihalkon (senyawa **3**) dan 2',4'-dihidroksi-3-bromo-4-hidroksi-5-metoksihalkon (senyawa **4**). Senyawa **1** diperoleh melalui reaksi klorinasi antara vanilin dengan $Ca(ClO)_2$. Senyawa **2** diperoleh melalui reaksi brominasi antara vanilin dengan $KBrO_3$ dalam pelarut asam asetat glasial dan katalis HBr. Senyawa **3** dan **4** diperoleh dari senyawa **1** dan **2** yang direaksikan dengan 2-4-dihidroksiasetofenon melalui kondensasi Claisen-Schmidt dengan menggunakan katalis basa KOH 40% dan KSF montmorillonit dalam pelarut metanol. Semua produk dilakukan karakterisasi menggunakan FTIR, GC-MS, TLC-*Scanner*, MS-*Direct*, ^{1}H-NMR and ^{13}C-NMR. Senyawa **1**, **2**, **3** dan **4** diuji aktivitas antioksidannya menggunakan DPPH. Hasil penelitian menunjukkan bahwa senyawa **1**, **2**, **3** dan **4** berhasil disintesis dengan rendemen masing-masing sebesar 52,77, 97,00, 1,86, dan 1,00 %. Hasil uji aktivitas antioksidan senyawa **1**, **2**, **3** dan **4** memiliki nilai IC_{50} sebesar 244,11, 269,44, 60,00 dan 162,10 μg/mL. Berdasarkan nilai IC_{50} senyawa **1** dan **2** tidak memiliki aktivitas antioksidan terhadap DPPH. Senyawa **3** memiliki aktivitas dengan kategori kuat dan senyawa **4** memiliki aktivitas dengan kategori lemah terhadap DPPH.

Kata kunci: klorinasi, brominasi, khalkon, antioksidan, DPPH

SYNTHESIS OF CHALCONE DERIVATIVES FROM 2,4-DIHYDROXYACETOPHENONE WITH HALOGENATED VANILLIN AND TESTING ITS ACTIVITY AS AN ANTIOXIDANT

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ABSTRACT

The syntheses and antioxidant activity test have been conducted for 3-chloro-4-hydroxy-5-methoxybenzaldehyde (compound **1**), 3-bromo-4-hydroxy-5-methoxybenzaldehyde (compound **2**), 2',4'-dihydroxy-3-chloro-4-hydroxy -5-methoxyhalcone (compound **3**) and 2',4'-dihydroxy-3-bromo-4-hydroxy-5-methoxyhalcone (compound **4**). Compound **1** was synthesized through a chlorination reaction between vanillin and $Ca(ClO)_2$, Compound **2** was obtained by a bromination reaction between vanillin and $KBrO_3$ in glacial acetic acid solvent with HBr catalyst. Compounds **3** and **4** were synthesized from compounds **1** and **2** which were reacted with 2-4-dihydroxyacetophenone by Claisen-Schmidt condensation using 40% KOH as a base catalyst and KSF montmorillonite in methanol. All synthesized compounds were characterized using FTIR, GC-MS, TLC-Scanner, MS-Direct, ^{1}H-NMR and ^{13}C-NMR. These compounds were also assessed for their antioxidant properties using DPPH. The results showed that compound **1, 2, 3** and **4** were succesfully synthesized with 52.77%, 97.00%, 1.86%, and 1.00% of yield, respectively. Based on the results of the antioxidant activity test, compounds **1**, **2**, **3** and **4** showed IC_{50} values of 244.11, 269.44, 60.00 and 162.10 g/mL, respectively. The IC_{50} values of compounds **1** and **2** suggested that these compounds did not have antioxidant activities against DPPH. Meanwhile, compound **3** has a strong category of activity and compound **4** has a weak category of activity against DPPH

Keywords: chlorination, bromination, chalcones, antioxidants, DPPH