SINTESIS N-ASETILPIRAZOLINA BERBAHAN DASAR VANILIN DAN 2-HIDROKSIASETOFENON SERTA UJI SITOTOKSISITASNYA TERHADAP BEBERAPA SEL KANKER

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INTISARI

Sintesis dan uji sitotoksisitas senyawa N-asetilpirazolina dari vanilin dengan 2-hidroksiasetofenon telah berhasil dilakukan. Tahap awal, sintesis kalkon dari vanilin dan 2-hidroksiasetofenon dilakukan dengan katalis KOH 40% (b/v) dengan metode pengadukan selama 48 jam. Tahap selanjutnya, senyawa N-asetilpirazolina disintesis dari kalkon dan hidrazina monohidrat dalam asam asetat glasial dengan cara pemanasan selama 6 jam. Elusidasi struktur produk dilakukan dengan menggunakan spektrometer FT-IR, GC-MS, ^{1}H- dan ^{13}C-NMR. Uji sitotoksisitas senyawa N-asetilpirazolina terhadap sel kanker HeLa, T47D, WiDr dan sel normal Vero dilakukan dengan metode MTT.

Produk sintesis kalkon berupa padatan kuning dengan rendemen 25,99% dan titik leleh 123,4-124,6 ^{o}C sedangkan produk N-asetilpirazolina berupa padatan putih tulang dengan rendemen 61,35% dan titik leleh 207,0-209,0 ^{o}C.

Berdasarkan uji sitotoksistas menunjukkan bahwa senyawa N-asetilpirazolina memberikan toksisitas sedang terhadap sel kanker HeLa, WiDr serta Vero dan toksisitas lemah terhadap sel T47D dengan nilai IC_{50} secara berturut-turut 103,06; 72,67; 124,71 dan 345,34 µg/mL. Rendahnya aktivitas senyawa N-asetilpirazolina diduga terjadi karena adanya gugus hidroksi pada posisi *orto*.

Kata kunci : kalkon, N-asetilpirazolina, sitotoksisitas, vanilin

SYNTHESIS OF N-ACETYLPYRAZOLINE FROM VANILLIN AND 2–HYDROXYACETOPHENONE AND ITS CYTOTOXICITY TEST TOWARD SOME CANCER CELLS

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ABSTRACT

Synthesis and cytotoxicity test of N-acetylpyrazoline have been carried out. First, chalcone was synthesized from vanillin and 2-hydroxyacetophenone using KOH 40% (w/v) under stirring for 48 hours. Second, synthesis of N-acetylpyrazoline was conducted by heating the chalcone and hydrazine monohydrate in the presence of glacial acetic acid for 6 hours. The structure elucidation of products were performed by FT-IR, GC-MS, ^{1}H- and ^{13}C-NMR spectrometers. Cytotoxicity tests of N-acetylpyrazoline against HeLa, T47D, WiDr cancer cells also Vero cell line were conducted by MTT assay.

The product of chalcone had m.p 123.4-124.6 ^{o}C in 25.99% yield as yellow solid, while N-acetylpyrazoline was yielded in 61.35% as white solid with m.p 207.0-209.0 ^{o}C.

The research of cytotoxicity test showed that N-acetylpyrazoline has moderate toxicity against HeLa, WiDr and Vero cell lines but weak toxicity against T47D cell with IC_{50} value 103.06; 72.67; 124.71 and 345.34 µg/mL, respectively. The low toxicities of N-acetylpyrazoline was probably due to the presence of hydroxyl group at orto position.

Keywords: chalcone, N-acetylpyrazoline, citotoxicity, vanillin