

SINTESIS TURUNAN N-ASETILPIRAZOLINA BERBAHAN DASAR VERATRALDEHIDA DAN 2,4-DIHIDROKSIASETOFENON SERTA UJI SITOTOKSISITASNYA TERHADAP BEBERAPA SEL KANKER

Istna Chunaifah
13/347398/PA/15224

INTISARI

Sintesis dan uji sitotoksitas senyawa *N*-asetilpirazolina dari veratraldehida dan 2,4-dihidroksiasetofenon telah dilakukan. Tahap awal adalah mensintesis kalkon melalui reaksi kondensasi *Claisen-Schmidt* antara veratraldehida dan 2,4-dihidroksiasetofenon dengan katalis KOH 40% (b/v) menggunakan metode pengadukan dan sonokimia. Tahap selanjutnya, senyawa *N*-asetilpirazolina disintesis melalui siklokondensasi dengan mereaksikan kalkon dengan hidrazin monohidrat dan asam asetat glasial menggunakan metode refluks dan sonokimia. Elusidasi struktur produk dilakukan menggunakan spektrometer FTIR, *direct*-MS, *KLT-Scanner*, ¹H- dan ¹³C-NMR. Uji sitotoksitas *N*-asetilpirazolina terhadap sel kanker HeLa, MCF-7, T47D dan WiDr serta sel normal Vero dilakukan menggunakan metode MTT.

Produk sintesis kalkon berupa padatan kuning oranye dengan titik lebur 203-205 °C dan rendemen 18,90% menggunakan metode pengadukan serta 27,40% menggunakan sonokimia. Sedangkan produk *N*-asetilpirazolina dihasilkan padatan putih dengan titik lebur 209-211 °C dan rendemen 89,89% menggunakan metode refluks dan 91,01% menggunakan sonokimia.

Uji sitotoksitas menunjukkan bahwa senyawa *N*-asetilpirazolina memberikan toksisitas sedang terhadap sel kanker WiDr dan toksisitas lemah terhadap sel kanker HeLa, MCF-7 dan T47D serta tidak bersifat toksik terhadap sel normal Vero. Nilai IC₅₀ *N*-asetilpirazolina terhadap sel WiDr, HeLa, MCF-7, T47D dan Vero secara berturut-turut 129,80; 481,66; 395,26; 223,23 dan 581,90 µg/mL. Rendahnya aktivitas senyawa *N*-asetilpirazolina diduga terjadi karena adanya gugus hidroksi pada posisi *orto*.

Kata kunci : kalkon, *N*-asetilpirazolina, sitotoksitas, veratraldehida.

SYNTHESIS OF N-ACETILPYRAZOLINE FROM VERATRALDEHYDE AND 2,4-DIHYDROXYACETOPHENONE AND ITS CYTOTOXICITY TEST AGAINST SOME CANCER CELLS

Istna Chunaifah
13/347398/PA/15224

ABSTRACT

Synthesis and cytotoxicity test of *N*-acetylpyrazoline have been carried out. Chalcone was synthesized from veratraldehyde and 2,4-dihydroxyacetophenone using KOH 40% (w/v) by conventional (stirring) and sonochemistry methods. Synthesis of *N*-acetylpyrazoline was conducted by cyclocondensation reaction of chalcone, hydrazine hydrate and acetic glacial by conventional (reflux) and sonochemistry methods. The structure elucidation of products was confirmed by FTIR, direct-MS, TLC-Scanner, ¹H- and ¹³C-NMR spectrometers. Cytotoxicity tests of *N*-acetylpyrazoline against HeLa, MCF-7, T47D and WiDr cancer cells also Vero cell line were conducted by MTT assay.

The product of chalcone had m.p. 203-205 °C as yellow solid in 18.40% yield by stirring method and 27.40% yield by sonochemistry method. While *N*-acetylpyrazoline was yielded as white solid with m.p 209-211 °C in 89.89 and 91.01% by reflux and sonochemistry method, respectively.

The research of cytotoxicity test showed that *N*-acetylpyrazoline has moderate toxicity against WiDr cell, weak toxicity against HeLa, MCF-7 and T47D and no toxicity against Vero cell line. The IC₅₀ values against HeLa, MCF-7, T47D, WiDr and Vero cell were 481.66; 395.26; 223.23; 129.80 and 581.90 µg/mL, respectively. The low toxicities of *N*-acetylpyrazoline was probably due to the presence of hydroxyl group at ortho position.

Keywords: chalcone, *N*-acetylpyrazoline, cytotoxicity, veratraldehyde