SINTESIS SENYAWA *N*-HIDROGEN PIRAZOLINA DARI BAHAN DASAR *p*-ANISALDEHIDA DAN 2,4-DIHIDROKSIASETOFENON SERTA UJI SITOTOKSISITASNYA TERHADAP BEBERAPA SEL KANKER

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INTISARI

Sintesis senyawa *N*-hidrogen pirazolina dari bahan dasar *p*-anisaldehida dan 2,4-dihidroksiasetofenon serta uji sitotoksisitasnya terhadap beberapa sel kanker telah dilakukan dengan mereaksikan 2,4-dihidroksiasetofenon dengan *p*-anisaldehida dalam pelarut metanol dan katalis KOH 40% dan disonikasi selama 7 jam. Selanjutnya, untuk sintesis *N*-hidrogen pirazolina dilakukan dengan mereaksikan kalkon hasil sintesis dengan hidrazin monohidrat dalam sonikator selama 2,5 jam. Kalkon dan pirazolina diidentifikasi dengan KLT dan dikarakterisasi dengan KLT *scanner, direct inlet* MS, FT-IR, ^{1}H- dan ^{13}C-NMR. Uji sitotoksisitas senyawa antikanker dilakukan dengan metode MTT, dimana pada metode tersebut dibuat larutan standar dengan variasi konsentrasi yang diujikan terhadap sel T47D, MCF-7, WiDr dan sel HeLa di dalam plat 96 sumuran.

Hasil sintesis kalkon didapatkan padatan berwarna kuning terang dengan rendemen 45,53% dan kemurnian 86,45% dengan titik lebur 177,5-180,5 ^{o}C. Pada sintesis pirazolina didapatkan padatan berwarna putih kecokelatan dengan rendemen 96,77% dan kemurnian 95,03% serta titik lebur sebesar 152,6-154 ^{o}C. Uji sitotoksisitas *N*-hidrogen pirazolina memperoleh nilai IC_{50} terhadap sel WiDr, HeLa, T47D dan MCF-7 masing-masing sebesar 42,99; 51,55; 66,06 dan 74,05 µg/mL. Data tersebut menunjukkan bahwa senyawa *N*-hidrogen pirazolina memiliki sitotoksisitas sedang dan efektif menghambat proliferasi sel kanker sehingga dapat dikembangkan menjadi agen antikanker.

Kata kunci: kalkon, *N*-hidrogen pirazolina, *p*-anisaldehida, sonikasi, uji sitotoksisitas

SYNTHESIS TEST OF *N*-HYDROGEN PYRAZOLINE FROM 2,4-DIHYDROXYACETOPHENONE AND *p*-ANISALDEHYDE AND ITS CYTOTOXICITY TEST TOWARD SOME CANCER CELLS

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ABSTRACT

Synthesis of *N*-hydrogen pyrazoline and its cytotoxicity test towards cancer cells have been carried out, starting from materials 2,4-dihydroxyacetophenone and *p*-anisaldehyde and catalyst KOH 40%. Chalcone have been synthesized from those starting materials with sonochemistry method in 7 hours. Cyclocondesation reaction of chalcone with hydrazine monohydrate gave *N*-hydrogen pyrazoline with sonochemistry method in 2.5 hours. Then, those products were characterized by TLC, TLC-scanner, direct inlet MS, FT-IR, ^{1}H- and ^{13}C-NMR. For cytotoxicity of *N*-hydrogen pyrazoline, used MTT method, where made standard solutions in various concentration toward WiDr, MCF-7, T47D and HeLa in 96 well plate.

Synthesized of chalcone obtained bright yellow solid product with yield 45.53%, purity 86.45% and melting point 177.5-180.5 ^{o}C. *N*-hydrogen pyrazoline was obtained as brown white solid with yield 95.74% and purity 95.05%, also had melting point at 152.6-154 ^{o}C. From the cytotoxicity test of the product, it was shown that the IC_{50} of *N*-hydrogen pyrazoline againts WiDr, T47D, HeLa and MCF-7 was 42.99; 66.06; 51.55 and 74.05 µg/mL. It was concluded that *N*-hydrogen pyrazoline has medium toxicity againts WiDr, T47D, HeLa and MCF-7 cells and inhibits cancer cell's proliferation effectively.

Keywords: Chalcone, *N*-hydrogen pyrazoline, *p*-anisaldehyde, sonochemistry, cytotoxicity