

ABSTRAK

SINTESIS, KARAKTERISASI, DAN UJI ANTIPROLIFERASI SENYAWA DIFENILTIMAH(IV) DI-(2-NITROBENZOAT) DAN TRIFENILTIMAH(IV) 2-NITROBENZOAT TERHADAP SEL KANKER PAYUDARA *MICHIGAN CANCER FOUNDATION-7 (MCF-7)*

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Kanker payudara merupakan salah satu jenis kanker dengan jumlah penderita yang terus meningkat setiap tahun, sehingga diperlukan pengembangan pengobatan alternatif dengan efek samping minimal, salah satunya melalui senyawa organotimah(IV) karboksilat. Penelitian ini bertujuan untuk mensintesis, karakterisasi, dan melakukan uji antiproliferasi senyawa difeniltimah(IV) di-(2-nitrobenzoat) dan trifeniltimah(IV) 2-nitrobenzoat sebagai antikanker terhadap sel kanker payudara MCF-7 yang disintesis dengan metode refluks selama 4 jam dengan suhu 60-61°C dalam pelarut metanol, lalu hasil sintesis dikeringkan selama 3 bulan di dalam desikator hingga diperoleh padatan kering dan dikarakterisasikan dengan menggunakan spektrofotometer UV-Vis, *Fourier Transform-Infra Red* (FT-IR), ¹H-NMR dan ¹³C-NMR, serta *Microelemental Analyzer*.

Hasil sintesis senyawa difeniltimah(IV) di-(2-nitrobenzoat) berupa padatan berwarna putih sebanyak 1,6443 g dengan rendemen sebesar 90,64% dan trifeniltimah(IV) 2-nitrobenzoat berupa padatan berwarna putih sebanyak 1,4010 g dengan rendemen sebesar 90,56%.

Senyawa tersebut dilakukan uji antiproliferasi terhadap sel kanker payudara MCF-7 sehingga diperoleh hasil IC₅₀ senyawa difeniltimah(IV) di-(2-nitrobenzoat) sebesar 7,62 µg/mL dan trifeniltimah(IV) 2-nitrobenzoat sebesar 7,08 µg/mL, serta hasil uji selektivitas kedua senyawa diperoleh nilai indeks ≥10. Berdasarkan hasil tersebut, kedua senyawa organotimah(IV) yang disintesis menunjukkan potensi sebagai agen antikanker terhadap sel kanker payudara MCF-7.

Kata Kunci: senyawa difeniltimah(IV) di-(2-nitrobenzoat), trifeniltimah(IV) 2-nitrobenzoat, sel kanker payudara MCF-7, antiproliferasi.

ABSTRACT

SYNTHESIS, CHARACTERIZATION, AND ANTIPROLIFERATION TEST OF DIPHENYLTIN(IV) DI-(2-NITROBENZOATE) AND TRIPHENYLTIN(IV) 2-NITROBENZOATE COMPOUNDS AGAINST BREAST CANCER CELLS MICHIGAN CANCER FOUNDATION-7 (MCF-7)

By

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Breast cancer is a type of cancer with a number of sufferers that continues to increase every year, so it is necessary to develop alternative treatments with minimal side effects, one of which is through organotin(IV) carboxylate compounds. This study aims to synthesize, characterize, and conduct antiproliferation tests of diphenyltin(IV) di-(2-nitrobenzoate) and triphenyltin(IV) 2-nitrobenzoate compounds as anticancer against MCF-7 breast cancer cells which are synthesized by the reflux method for 4 hours at a temperature of 60-61°C in methanol solvent, then the synthesis results are dried for 3 months in a desiccator until a dry solid is obtained and characterized using a UV-Vis spectrophotometer, Fourier Transform-Infra Red (FT-IR), ¹H-NMR and ¹³C-NMR, and Microelemental Analyzer.

The synthesis results of the diphenyltin(IV) di-(2-nitrobenzoate) compound in the form of a white solid amounting to 1.6443 g with a yield of 90.64% and triphenyltin(IV) 2-nitrobenzoate in the form of a white solid amounting to 1.4010 g with a yield of 90.56%.

These compounds were subjected to antiproliferation tests against MCF-7 breast cancer cells, resulting in IC₅₀ results for the diphenyltin(IV) di-(2-nitrobenzoate) compound of 7.62 µg/mL and triphenyltin(IV) 2-nitrobenzoate of 7.08 µg/mL, and the selectivity test results for both compounds obtained an index value ≥10. Based on these results, both synthesized organotin(IV) compounds show potential as anticancer agents against MCF-7 breast cancer cells.

Keywords: diphenyltin(IV) di-(2-nitrobenzoate), triphenyltin(IV) 2-nitrobenzoate, MCF-7 breast cancer cells, antiproliferation.