

ABSTRAK

SINTESIS, KARAKTERISASI, DAN UJI ANTIPROLIFERASI SENYAWA DIBUTILTIMAH(IV) DI-(3-NITROBENZOAT) DAN DIBUTILTIMAH(IV) DIBENZOAT TERHADAP SEL KANKER PAYUDARA *MICHIGAN CANCER FOUNDATION-7* (MCF-7)

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Penelitian ini bertujuan untuk mendapatkan senyawa-senyawa turunan organotimah(IV) yaitu senyawa dibutiltimah(IV) di-(3-nitrobenzoat) dan dibutiltimah(IV) dibenzoat, mengetahui karakteristik dari senyawa tersebut dengan menggunakan spektrofotometer UV-Visible, FTIR, ^1H dan ^{13}C -NMR, serta *microelemental analyzer* dan mengetahui aktivitas antiproliferasi terhadap sel kanker payudara MCF-7 dan aktivitasnya dibandingkan dengan sel normal.

Senyawa dibutiltimah(IV) di-(3-nitrobenzoat) dan dibutiltimah(IV) dibenzoat berhasil disintesis melalui reaksi antara dibutiltimah(IV) oksida dengan ligan asam 3-nitrobenzoat dan asam benzoat. Produk hasil sintesis berupa serbuk putih dengan massa berturut-turut sebesar 1,9643 dan 1,8888 g, serta presentase rendemen sebesar 82,63% dan 94,46%. Senyawa hasil sintesis dikarakterisasi dengan menggunakan spektrofotometer UV-Visible, FTIR, ^1H dan ^{13}C -NMR, serta *microelemental analyzer* untuk mengetahui kemurnian senyawa.

Aktivitas antiproliferasi senyawa sintesis telah diuji terhadap galur sel kanker payudara MCF-7 dan aktivitasnya dibandingkan dengan sel normal. Hasil uji antiproliferasi menunjukkan bahwa senyawa dibutiltimah(IV) di-(3-nitrobenzoat) dan dibutiltimah(IV) dibenzoat memiliki aktivitas antiproliferasi cukup aktif dengan nilai IC_{50} sebesar 1,03 dan 4,65 $\mu\text{g/mL}$ serta menunjukkan indeks selektivitas terhadap sel vero berturut-turut sebesar 35,39 dan 12,06.

Kata kunci: uji antiproliferasi, IC_{50} , sel MCF-7, dibutiltimah(IV) di-3-nitrobenzoat, dibutiltimah(IV) dibenzoat

ABSTRACT

SYNTHESIS, CHARACTERIZATION, AND ANTIPROLIFERATION TESTING OF DIBUTYLTIN(IV) DI-(3-NITROBENZOATE) AND DIBUTYLTIN(IV) DIBENZOATE COMPOUNDS AGAINST MICHIGAN CANCER FOUNDATION-7 (MCF-7) BREAST CANCER CELLS

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This study aims to obtain organotin(IV) derivative compounds, namely dibutyltin(IV) di-(3-nitrobenzoate) and dibutyltin(IV) dibenzoate, to determine the characteristics of these compounds using UV-Visible, FTIR, ^1H and ^{13}C -NMR spectrophotometers, and microelemental analyzers and to determine the antiproliferative activity against MCF-7 breast cancer cells and its activity compared to normal cells.

Dibutyltin(IV) di-(3-nitrobenzoate) and dibutyltin(IV) dibenzoate compounds were successfully synthesized through the reaction between dibutyltin(IV) oxide with 3-nitrobenzoic acid and benzoic acid ligands. The synthesis products were in the form of white powder with masses of 1.9643 and 1.8888 grams respectively, and yield percentages of 82.63% and 94.46%. The synthesized compounds were characterized using UV-Visible spectrophotometer, FTIR, ^1H and ^{13}C -NMR, and microelemental analyzer to determine the purity of the compounds.

The antiproliferative activity of the synthesized compounds was tested against the MCF-7 breast cancer cell line and its activity was compared with normal cells. The results of the antiproliferative test showed that the compounds dibutyltin(IV) di-(3-nitrobenzoate) and dibutyltin(IV) dibenzoate had quite active antiproliferative activity with IC_{50} values of 1.03 and 4.65 $\mu\text{g/mL}$ and showed selectivity indices against vero cells of 35.39 and 12.06, respectively.

Keywords : antiproliferation assay, IC_{50} , MCF-7 cells, dibutyltin(IV) di-3-nitrobenzoate, dibutyltin(IV) dibenzoate