SINTESIS KANDIDAT SENYAWA ANTIBAKTERI MONOPALMITIN MELALUI TRANSESTERIFIKASI ETIL PALMITAT DENGAN GLISEROL TERPROTEKSI 1,3-DIOXOLAN

Taslim Wahyudin
13/357743/PPA/04499

INTISARI

Monopalmitin telah disintesis dari reaksi antara etil palmitat dan senyawa gliserol terproteksi 1,3-dioxolan. Tahap pertama sintesis adalah proteksi dua gugus hidroksil dari senyawa gliserol, langkah selanjutnya adalah reaksi transesterifikasi etil palmitat dengan senyawa gliserol terproteksi menggunakan katalis heterogen Na_2CO_3. Langkah terakhir adalah reaksi pembukaan cincin senyawa 1,3-dioxolan menggunakan katalis *amberlyst 15 (wet)* sehingga dua gugus hidroksil yang terproteksi kembali seperti semula. Semua produk sintesis yang dihasilkan setiap tahapan dianalisis strukturnya dengan spektrometer FTIR, GC-MS/*direct*-MS, ^{1}H-NMR dan ^{13}C-NMR. Terhadap senyawa monopalmitin hasil sintesis dilakukan uji antibakteri menggunakan bakteri Gram positif (*Staphylococcus aureus*) dan bakteri Gram negatif (*Escherichia coli*) dengan gentamisin sebagai kontrol positif dan DMSO 99.99% sebagai kontrol negatif.

Hasil penelitian menunjukkan bahwa etil palmitat, 2,2-dimetil-1,3-dioxolan-4-metanol, 2,2-dimetil-1,3-dioxolan-4-metil palmitat, dan senyawa monopalmitin berhasil disintesis dan diperoleh rendemen secara berurutan sebesar 30, 57, 73 dan 80%. Hasil uji aktivitas menunjukkan bahwa monopalmitin tidak aktif sebagai senyawa antibakteri baik terhadap bakteri Gram positif maupun bakteri Gram negatif bahkan dengan konsentrasi senyawa monopalmitin 1000 ppm.

Kata kunci: monogliserida, 1,3-dioxolan, transesterifikasi, *amberlyst 15 (wet)*, antibakteri

SYNTHESIS OF ANTIBACTERIAL COMPOUND CANDIDATE OF MONOPALMITIN THROUGH TRANSESTERIFICATION OF ETHYL PALMITATE WITH 1,3-DIOXOLANE PROTECTED GLYCEROL

Taslim Wahyudin
13/357743/PPA/04499

ABSTRACT

Monopalmitin had been synthesized from the reaction between ethyl palmitate and glycerol protected by 1,3-dioxolane. The first stage of the synthesis was the protection of the two hydroxyl groups of the glycerol, the next step was transesterification reaction of ethyl palmitate and the protected glycerol using heterogeneous catalyst of Na_2CO_3. The final step was the ring-opening reaction of 1,3-dioxolane compounds using amberlyst 15 (wet) so that the two hydroxyl groups that previously protected formed hydroxyl groups again. All products of each step were identified by FTIR, GC-MS, ^{1}H-NMR and ^{13}C-NMR. The antibacterial activity of the synthesized products was tested against Gram positive bacteria (*Staphylococcus aureus*) and Gram negative bacteria (*Escherichia coli*) with gentamycin as positive control and DMSO 99.99% as negative control.

The result showed that ethyl palmitate, 2,2-dimethtyl-1,3-dioxolane-4-methanol, 2,2-dimethyl-1,3-dioxolane-4-methyl palmitate, and 1-monopalmitin were successfully synthesized in 30, 57, 72 and 80% yields, respectively. The results of activity test showed that monopalmitin was inactive as antibacterial compounds against either Gram positive or Gram negative bacteria even at the concentration of 1000 ppm.

Key words: monoglyceride, 1,3-dioxolane, transesterification, amberlyst 15 (wet), antibactery