



SYNTHESIS OF 4-AMINOQUINOLINE DERIVATIVE VIA NUCLEOPHILIC AROMATIC SUBSTITUTION REACTION

Naufal Andika Prathama
15/381230/PA/16768

ABSTRACT

Synthesis of 4-aminoquinoline derivatives has been carried out from the starting material of 4,7-dichloroquinoline with different kind of amines. The study was aimed to modify the structure of 4-aminoquinoline by introducing short and bulky alkyl side chain. The synthesis follows nucleophilic aromatic substitution by reacting 4,7-dichloroquinoline with butylamine, benzylamine and piperazine. 4,7-Dichloroquinoline was reacted with butylamine at 120-130 °C for 6 hour, benzylamine in DMF under reflux for 10 hour, and piperazine in triethylamine at 130 °C for 4 hour. All of the products were then analyzed by ¹H-, ¹³C-NMR, and FTIR spectrometers.

The results showed that nucleophilic aromatic substitution reaction between 4,7-dichloroquinoline and butylamine gave *N*-butyl-7-chloroquinolin-4-amine as yellow solid in 76% yield. Next, *N*-benzyl-7-chloroquinolin-4-amine was obtained from 4,7-dichloroquinoline and benzylamine, as white solid in 22% yield. The reaction involving 4,7-dichloroquinoline and piperazine gave 7-chloro-4-(piperazin-1-yl)quinoline as yellow solid in 92% yield.

Keywords: 4-aminoquinoline, benzylamine, butylamine, piperazine, nucleophilic aromatic substitution.



SISNTESIS TURUNAN 4-AMINOKUINOLIN MELALUI REAKSI SUBSTISUSI AROMATIK NUKLEOFILIK

Naufal Andika Prathama
15/381230/PA/16768

INTISARI

Sintesis turunan 4-aminokuinolin telah dilakukan dari bahan dasar 4,7-diklorokuinolin dengan berbagai jenis amina. Penelitian ini bertujuan untuk memodifikasi struktur 4-aminokuinolin dengan mereaksikan rantai samping alkil pendek dan besar. Sintesis ini melalui substitusi nukleofilik aromatik dengan mereaksikan 4,7-diklorokuinolin dengan butilamina, benzilamina dan piperazin. 4,7-diklorokuinolin direaksikan dengan butilamina pada 120-130 °C selama 6 jam, benzilamina dalam DMF, refluks selama 10 jam, dan piperazin dalam trietilamina pada suhu 130 °C selama 4 jam. Semua produk kemudian dianalisis dengan spektrometer ^1H -, ^{13}C -NMR, dan FTIR.

Hasil penelitian menunjukkan bahwa reaksi substitusi nukleofilik aromatik antara 4,7-diklorokuinolin dan butilamina memberikan *N*-butil-7-klorokuinolin-4-amina berupa padatan kuning dengan persen hasil 76%. Selanjutnya, *N*-benzil-7-klorokuinolin-4-amina diperoleh dari 4,7-diklorokuinolin dan benzilamina, berupa padatan putih dengan persen hasil 22%. Reaksi yang menggunakan 4,7-diklorokuinolin dan piperazin menghasilkan 7-kloro-4-(piperazin-1-yl)kuinolin sebagai padatan kuning dalam persen hasil 92%.

Kata Kunci: 4-aminokuinolin, benzilamina, butiamina, piperazin, reaksi susbtitusi aromatik nukleofilik.