

Sintesis senyawa 6-Amino-2-[(E)-2-[4-(dimetilamino)fenil]etenil]-3,4-dihidrokuinazolin-4-on = Synthesis of 6-Amino-2-[(E)-2-[4-(dimethylamino)phenyl]ethenyl]-3,4-dihydroquinazolin-4-one

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Abstrak

Senyawa turunan kuinazolin-4(3H)-on telah diketahui memiliki aktivitas farmakologis yang luas. Senyawa 2-stirilkuinazolin-4(3H)-on secara khusus memiliki aktivitas penghambatan polimerisasi tubulin, Epidermal Growth Factor Receptor, dan dihidrofolat reduktase yang berperan penting dalam terjadinya tumor. Pada penelitian ini, dilakukan sintesis senyawa baru turunan 2-stirilkuinazolin-4(3H)-on tersubstitusi pada posisi 6, yaitu 6-amino-2-[(E)-2-[4-(dimetilamino)fenil]etenil]-3,4-dihidrokuinazolin-4-on. Sintesis dilakukan dalam empat tahap: sintesis 2-metilkuinazolin-4(3H)-on, nitrasi membentuk 2-metil-6-nitrokuinazolin-4(3H)-on, kondensasi dengan p-dimetilaminobenzaldehida membentuk 2-[(E)-2-[4-(dimetilamino)fenil]etenil]-6-nitro-3,4-dihidrokuinazolin-4-on, dan reduksi membentuk 6-amino-2-[(E)-2-[4-(dimetilamino)fenil]etenil]-3,4-dihidrokuinazolin-4-on. Struktur molekul senyawa produk tahap satu dan dua dikonfirmasi dengan spektroskopi FT-IR. Struktur molekul senyawa produk tahap tiga dan empat dikonfirmasi dengan spektroskopi FT-IR dan ¹H-NMR. Hasil penelitian menunjukkan bahwa senyawa produk sesuai dengan senyawa yang diharapkan dengan rendemen sebagai berikut: tahap satu 90,2 %, tahap dua 79,61 %, tahap tiga 73,27 %, dan tahap empat 56,69 %.

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Derivatives of quinazolin-4(3H)-one are known to have broad pharmacological activities. The 2-styrylquinazolin-4(3H)-one is known for its inhibition activity of tubulin polymerization, epidermal growth factor receptor, and dihydrofolate reductase which play important roles on tumor development. In this research, the novel 2-styrylquinazolinone substituted on C6 position derivative, 6-amino-2-[(E)-2-[4-(dimethylamino)phenyl]ethenyl]-3,4-dihydroquinazolin-4-one was synthesized in four steps: formation of 2-methylquinazolin-4(3H)-one, nitration to form 2-methyl-6-nitroquinazolin-4(3H)-one, further reaction with p-dimethylaminobenzaldehyde yielding 2-[(E)-2-[4-(dimethyl-amino)phenyl]ethenyl]-6-nitro-3,4-dihydroquinazolin-4-one, and reduction to 6-amino-2-[(E)-2-[4-(dimethylamino)phenyl]ethenyl]-3,4-dihydroquinazolin-4-one. Molecular structures of first and second reaction products were confirmed with FT-IR spectroscopy. Molecular structures of third and fourth reaction products were confirmed with FT-IR and ¹H-NMR spectroscopy. Results show that molecular structures of the products meet the predicted structure, with reaction yields as follow: first step 90,2 %, second step 79,61 %, third step 73,27 %, and fourth step 56,69 %.