Abstract

In the planned research work, the synthesis of 2-[(4-halobenzyl)sulfanyl]-5-(4-nitrobenzyl)-1,3,4-oxadiazoles was done in a systematic way. First of all 2-(4-Nitrophenyl)acetic acid (**1**) was subjected to reflux in the presence of sulphuric acid and ethanol for 12 hours continuously and Ethyl 2-(4-nitrophenyl)acetate (**2**) was formed. In the next step, Ethyl 2-(4-nitrophenyl)acetate (**2**) was then subjected to reflux for 15 hours in the presence of methanol and hydrazine which resulted in the formation of 2-(4-Nitrophenyl)acetohydrazide (**3**). In the next step, 2-(4-Nitrophenyl)acetohydrazide (**3**) was kept under continuous reflux for 17 hours in the presence of ethanol, carbon disulfide and potassium hydroxide and it get converted to 5-(4-Nitrobenzyl)-1,3,4-oxadiazole-2-thiol (**4**). In the next step, 5-(4-Nitrobenzyl)-1,3,4-oxadiazole-2-thiol (**4**) was reacted with 4-florobenzyl bromides (**5a)** and 4-bromobenzyl bromides (**5b)** separately in the presence of DMF and LiH and then with continuous stirring for 20-22 hours and the reaction which occur with **5a** formed 2-[(4-Fluorobenzyl)sulfanyl]-5-(4-nitrobenzyl)-1,3,4-oxadiazole (**6a**), while of 2-[(4-Bromobenzyl)sulfanyl]-5-(4-nitrobenzyl)-1,3,4-oxadiazole (**6b**) was formed in other beaker. The suggested structures of the synthesized compounds were characterized by their proton-nuclear magnetic resonance (^{1}H-NMR), carbon-nuclear magnetic resonance (^{13}C-NMR) and Infra-Red (IR) spectral data. The antibacterial activity, antifungal activity, alpha amylase inhibition activity, alpha glucosidase inhibiyion activity and hemolytic of the newly synthesized compounds was determined.