Synthesis and spectroscopic studies of some heterocyclic compoounds and its application as surface active agent

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The presentwork aims to synthesize some new quinazoline and thiadiazole derivatives and to study their spectral and surface active properties. Thus we choose to synthesize quinazoline and thiadiazole derivatives containing palmityl group.Thesis contained four parts as the following:Part (1):It includes the synthesis of quinazolinone and quinazolinone derivatives from 3,1-benzoxazinone (1) which was prepared from the reaction of the acid chloride of palmitic acid with anthranilic acid.Fusion of 3,1-benzoxazinone (1) with amm. acetate at 170□C produced quinazolinone (2). 3-N-hydroxyquinazolinone (3) was obtained when -3,1-benzoxazinone (1) react with hydroxylamine hydrochloride, acetylation of 3-N -hydroxyquinazolinone (3) produces 3-N-acetoxy quinazolinone (4). 3-N ethoxycarbonylmethoxy quinazolin-4-one (5) was obtained when 3-hydroxy quinazolinone (3) was allowed to react with ethyl chloroacetate. Quinazolinyl urea (6) was obtained when 3,1-benzoxazinone (1) was reacted with semicarbazide hydrochloride. On fusion of the last compound (6) at its melting point produces triazolo quinazoline derivatives (7).Hydrazine hydrate reacted with 3,1-benzoxazinone (1) to afford 3-N- aminoquinazolinone (12a) which on acetylation with acetic anhydride it afforded acetamide derivatives (13) and on benzoylation -with benzoyl chloride gave benzamide derivatives (14). (4-Oxo-2-pentadecyl-4H quinazolin-3-yl amino)-acetic acid ethyl ester obtained when 3-N- amino quinazolinone (12a) was allowed to react with ethyl chloroacetate. Condensation of 3-N- amino quinazolinone (12a) with p-methoxy benzaldehyde afforded Schiff's base (16). (4-Oxo-2-pentadecyl-4H-quinazolin-3-yl)-acetic acid (11) obtained when 3,1-benzoxazinone (1) was allowed to react with glycine. When 3,1-benzoxazinone -was allowed to react with ethanolamine, it afforded 3-(2-hydroxy ethyl)-2-pentadecy-3H-quinazolin-4-one.Part (2):Palmitic acid was utilized in synthesis of 2-amino-1,3,4-thiadiazole (18) from its reaction with thiosemicarbazide in POCl3. The produced amino thiadiazole (18) used in synthesis of many derivatives such as acetyl, chloroacetamido-amino thiadiazole (19, 22) and phenyl urea derivatives (20) when reacted with acetic anhydride, chloro acetylchloride and phenyl isocyanate, respectively. Benzamido derivatives (21a,b) were obtained when 2-amino-1,3,4-thiadiazole (18) allowed to react with benzoyl chloride and/ or p-nitro benzoylchloride, respectively. 2-(5-pentadecyl-1,3,4-thiadiazol-2-yl)isoindoline-1,3-dione (24) was obtained from condensation of

2-amino-1,3,4-thiadiazole (18) with phthalic anhydride. The condensation of (18) with benzaldehyde and/ or p-methoxybenzaldehyde afforded Schiff's base (25a,b).All the synthesized compounds were confirmed via IR, 1HNMR and/ or Mass spectra.Part (3):Preparation of anionic surfactants.Anionic surfactants (26, 28, 30, 32, 34, 35a, 35b) were prepared, the surface active properties were measured. The results showed that good emulsifying properties and highly foaming and mor efficient wetting agents for all synthesized anionic surfactants and higher than nonionic surfactants. The all the tested compounds shows a good biodegradability properties than the nonionic surfactants.Preparation of nonionic surfactants.All nonionic surfactants were prepared by addition of propylene oxide (3, 5, 7, 10 moles) to any active hydrogen in the molecule, the surface active properties like surface tension and interfacial tension, cloud point, wetting time, emulsion stability, and foam height of these compounds were measured and showed a pronounced surface activities, good emulsifying properties and highly foaming in some of these compounds. The biodegradability properties were evaluated and it was found that all the tested compounds showed a good biodegradability properties which make them safe for human as well as environments.Also, the antimicrobial activities of some of these synthesized compounds were screened and the results show that all the tested compounds having from moderate to excellent effect towards bacteria gram (+ve) and gram (-ve), fungi and yeast.Part (4):Spectroscopic measurements were carried out such as effect of solvent on the fluorescence of compounds (3, 21a, 21b) and effect of pH on the absorption of compound (3).The results show that all the tested compounds (3, 21a, 21b) could be used as laser dyes when solvated in water & glycerol.