synthesis and evaluation of diffrrent types of surface active agents containing heteroy clicety

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SUMMARYIt was reported that heterocyclic nucleus likes thiazoles, oxazoles, triazoles, pyrazoles, pyridazines, phthalazine, oxapyrazoles and oxadi-azines were exhibits biological activities (203-206) and some of which have surface active properties (104,134) This encourage us to prepare someheterocyclic compounds having the above nucleus and using commercial fatty acids (stearic, palmitic and myristic acids) as starting material to synthesis compounds having a double function as antimicrobial and surface active agents.Part (1)It includes the synthesis of fatty acids isothiocyanate (myristic, palmitic and stearic acids) (3a-c) by the reaction of the corresponding acid chloride (2a-c) with ammonium thiocyanate. Treatment the solution of isothiocyanate (38-c) with phenyl hydrazine afforded -3-alky1-2-pheny1- 1,2,4-triazoliny1-5-thione (4a-c). Reaction of isothiocyanate (3a c) with glycine in presence of pyridine as a base produced 2-amidoalky1-2-thio1-1,3-oxazoline-5-one (5a-c). Reaction of isothiocyanate (3a-c) with anthranilic acid produces the thiourea derivatives (6a-c). Which were cyclized to 3-alkanoy1-1,3-quinazoline-2-thione-4-one (7a-c) by acetic anhydride. -Thiocarbamate derivatives (8a-c) which were produced from the reaction of o aminophenol with isothiocyanate (3a-c) and cyclized to 2-amidoalky1-1,3-benzoxazole (9a-c) by fusion. Treatment of isothio-cyanate (3a-c) with thioglycollic acid afforded (10a-c) which were cyclized by acetic anhydride to 3-alkanoy1-1,3-thiazolidine-2-thione-4- one (11a-c). Finally, when aniline condensed with isothiocyanate (3a-c)lead to formation of thiourea derivatives (12a-c). All these synthesizedcompounds were converted to new surface-active agents by reaction withSummarydifferent moles of propylene oxide (n = 3,5 and 7). The surface-active properties, biodegradability and antimicrobial activities of these compounds were evaluated. The obtained results show that, the products of the new surfactants containing heterocyclic ring have a pronounced surface activities, and biodegradable properties.Part (2)Long chain fatty acid (myristic, palmitic and stearic) hydrazides (13a-c) were prepared by the reaction of their acid chlorides with hydrazine hydrate in dry acetone. Reactions of fatty acid hydrazides (13a-c) with [3-benzoylacrylic acid, p-benzoylpropionic acid, maleic anhydride and/or -succinic anhydride lead to the formation of pyridazine derivatives (14a-c),(15a c),(16a-c) and/or (17a-c) respectively. Treatment of fatty acid hydrazide (13a-c) with carbon disulphide affords 5-alkyl-2- thio1-1, 3,4-oxadiazole (18a-c). When the acid hydrazide (13a-c) treated with chloroacetic acid • afforded

2-alkyl-1,3,4-oxadazine-5-one (19a-c). Reaction of the same hydrazides (13a-c) with phthalic anhydride gave I -N-alkanoylphthalazine-3,8-dione (20a-c). Pyrazole derivatives (2 1 a-c) and for (22a-c) were produced from the reaction of fatty acid -hydrazide (13a-c) with ethylbenzoylacetate and /or diethylmalonate.Thiazole deriv atives (24a-c) were prepared from the reaction of thioglycollic acid with the adduct of the schiff base (24a-c). Finally, treatment of schief base (24a-c) with ferric chloride gave 2-alkyl-5-phenyl-1,3,4-oxadiazole (25a-c). The synthesized products were oxypropylated under controlled conditions with a selected average number of -oxypropyl groups (n = 3, 5 and 7) to produce new nonionic surfactants. The surface active properties of the prepared products were compared and evaluated, including solubility, cloud point, surface and interfacial tension, foamingemulsification, also biodegradability properties and antimicrobial activities were examined. Most of the products are good biodegradable surfactants, which manifested the importance of their application in pollution-problems.Part (3)Sodium salt of a-sulphonated fatty acid isothiocyanates (myristic, palmitic and stearic) (27a-c) were prepared from the reaction of acid chloride (2a-c) and chlorosulphonic acid in carbon tetrachloride, then treated with ammonium thiocyanate which were utilized for preparation of some anionic surfactants hopping to increase its surface active properties. Treatment of the sulphonated isothiocyanate (27a-c) with phenylhydrazine afforded 3-N-(a-sulphonated alkyl)-2-phenyl-1, 2,4- triazoliny1-5-thione (28a-c). Reaction of isothiocyanate (27a-c) with glycine gave 2- (a-sulphonated amidoalkyl)-2-thio1-1,3-oxazolidine-5- one (29a-c). When the isothiocyanate (27a-c) treated with anthranilic acid, thiourea derivatives (30a-c) were obtained which cyclized by acetic anhydride to 2-(a-sulphonated alkanoy1)-1,3-quinazoline-2-thione-4-one (31a-c). Reaction of isothiocyanate (27a-c) with o-aminophenol gave thiocarbamate derivatives (32a-c) which cyclized to 1,3-benzoxazole derivatives (33a-c) by fusion. 1,3-Thiazolidine-2-thione-5-one derivatives (35a-c) produced from the reaction of isothiocyanate (27a-c) with thioglycollic acid followed by cyclization with acetic anhydride. Finally, thiourea derivatives (36a-c) were formed by treatment of isothiocyanate (27a-c) with aniline. The antimicrobial and antifungal of the prepared compounds were screened and most of these compounds were found to be highly active. The surface-active properties and biodegradability properties of these anionic surfactants were evaluated. The results showthat the products have a pronounced surface activity and good biodeg-radable surfactants.Part (4)This part concerns with the synthesis of amine oxide derivativesfrom some previously synthesized compounds (which contain heterocyclic ring and have a tertiary amino group) by oxidation with hydrogen peroxide. So the reaction of 1,2,4-triazoline-5-thione derivatives (48-c), thiazolidine derivatives (118-c), thiazole derivatives (21a-c) and pyrazole derivatives (24a-c) with H202 produces the amine oxide of (37a-c), (38a-c), (398-c) and (40a-c). The surface properties, biodegradability and antimicrobial activities of these compounds wereevaluated.